Eutech Instruments

2007 Catalogue

SOLUTIONS FOR WATER ANALYSIS

EUTECH INSTRUMENTS

Technology Made Easy ...

About Eutech

| Over 15 Years of Product Excellence | Eutech Instruments is a leading ISO9001-certified company established in 1990. Dedicated to the design and manufacture of sensor-based instruments for water quality analysis, Eutech is a pioneer in the development of ASIC-based (Application Specific Integrated Circuit) instruments, and is internationally recognised for its achievements in sensor technology, software programming and product design. Eutech has an extensive product line, which includes the world's first Windows® CE-driven colour touchscreen research-grade bench meter, as well as instruments with proprietary patents and trademarks.

| Commitment to R&D | Eutech's competitiveness comes from our strong commitment to R&D. This is backed by a dedicated team of scientists and engineers who thrives on meeting new technological challenges to simplify laboratory and field analytical procedures. The Eutech team is constantly driven to explore the latest technologies and applying them in our design and manufacture of advanced instruments. The result is a unique line of products that are accurate, consistent, reliable and easy to use.

| Comprehensive Product Line | Eutech's constant drive for innovation is reason for our unique and expansive portfolio of microprocessor-based instruments and chemical sensor systems. We offer a comprehensive range of laboratory and field instruments for electrochemical and photometric water analysis. Eutech also manufactures continuous on-line process instruments for the monitoring and control of pH, Conductivity, Total Dissolved Solids (TDS), Redox Potential (ORP), Dissolved Oxygen (DO) and other water quality parameters.

Eutech products range from compact pocket testers and handheld meters to research-grade benchtop meters and industrial process controllers. Each product carries the signature Eutech intuitive design and is packed with advanced user-friendly features.

| Customer Focus | Every Eutech innovation is conceptualised with the user in mind. This, coupled with our strategic location in the design and technology hub of Asia, has enabled the company to produce cutting edge instruments at competitive prices. Our consistent demonstration of insight into customer needs and product demands has earned the company consecutive Frost & Sullivan Market Engineering awards for Product Line Strategy.

Driven by a successful Total Customer Satisfaction Program incorporated in the ISO9001:2000 Quality System, all products undergo extensive testing and calibration by a qualified team of technical experts. Stringent quality control measures guarantee consistency, durability and performance. Eutech products are certified to comply with various global testing standards.

| Forging New Frontiers in Water Analysis | Underlying Eutech's objective to be a world leader in the field of water analysis instrumentation, the company adopts a proactive stand in anticipating the needs of the industry. With increasing global awareness and concern for water quality, the future provides new and exciting challenges and opportunities. To realize the potential of advanced water analytical technologies, Eutech will continue to forge close links and strategic alliances with research institutions, government agencies and private sector firms worldwide. These efforts support the Eutech mission – to make advanced technology easy to use.

| Global Reach | Eutech products are marketed in over seventy countries worldwide, through an extensive network of associate companies and distributors, with manufacturing facilities in Singapore and Malaysia. Eutech Instruments Singapore has a full-fledged value-chain operation which comprises R&D, manufacturing, marketing, customer service and logistics for worldwide support to customers.

| Thermo Fisher Scientific | Eutech is now part of Thermo Fisher Scientific, the world leader in serving science. Thermo Fisher Scientific enables customers to make the world healthier, cleaner and safer by providing analytical instruments, equipment, reagents and consumables, software and services for research, analysis, discovery and diagnostics. With annual sales of more than $9 billion, Thermo Fisher Scientific has 30,000 employees and serves more than 350,000 customers in pharmaceutical and biotech companies, hospitals and clinical diagnostic labs, universities, research institutions and government agencies as well as environmental, industrial quality and process control settings.

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Meter Selection Guide

pH Meter Quick Guide

Models	Parameters	Accuracy	Cal. Points	pH Buffer Sets	GLP	Memory	Temperature Display	Housing Rating	Communication	Page No.
Pocket Testers										
pHTestr 30	pH/°C/°F	±0.01 pH	3	USA, NIST	–	–	Yes	IP67	–	Pg 13
pHTestr 20	pH	±0.01 pH	3	USA, NIST	–	–	–	IP67	–	Pg 13
pHTestr 10	pH	±0.1 pH	3	USA, NIST	–	–	–	IP67	–	Pg 13
pHTestr 10BNC	pH	±0.01 pH	3	USA, NIST	–	–	Yes (MTC)	IP67	–	Pg 14
pHSpear	pH	±0.01 pH	3	USA, NIST	–	–	Yes (MTC)	IP67	–	Pg 15
Handheld Meters										
CyberScan PCD 650	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/°C/°F	±0.002 pH	6	USA, NIST, DIN, Custom	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 68
CyberScan PC 650	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/°C/°F	±0.002 pH	6	USA, NIST, DIN, Custom	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 69
CyberScan PD 650	pH/mV/Ion/Dissolved Oxygen/°C/°F	±0.002 pH	6	USA, NIST, DIN, Custom	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 70
CyberScan pH 620	pH/mV/Ion/°C/°F	±0.002 pH	6	USA, NIST, DIN, PWB, Custom	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 18
CyberScan pH 610	pH/mV/°C/°F	±0.002 pH	6	USA, NIST, DIN, PWB, Custom	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 18
CyberScan pH 600	pH/mV/°C/°F	±0.01 pH	6	USA, NIST, DIN, PWB, Custom	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 18
CyberScan pH 310	pH/mV/°C/°F	±0.01 pH	6	USA, NIST, DIN	Yes	50	Yes	IP67	–	Pg 19
CyberScan pH 300	pH/mV/°C	±0.01 pH	5	USA, NIST	–	16	Yes	IP67	–	Pg 19
CyberScan pH 110	pH/mV/°C/°F	±0.01 pH	5	USA, NIST, DIN, Low Ionic	–	100	Yes	IP54	RS232	Pg 20
CyberScan pH 11	pH/mV/°C	±0.01 pH	5	USA, NIST	–	50	Yes	IP54	–	Pg 20
EcoScan Ion 6	Ion/pH/mV/°C	±0.01 pH	3	USA, NIST, Low Ionic	–	–	Yes	IP54	–	Pg 21
EcoScan pH 6	pH/mV/°C	±0.01 pH	3	USA, NIST, Low Ionic	–	–	Yes	IP54	–	Pg 21
EcoScan pH 5	pH/°C	±0.01 pH	3	USA, NIST, Low Ionic	–	–	Yes	IP54	–	Pg 21
Bench Meters										
CyberScan PCD 6500	pH/°C/°F/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/ BOD/OUR/SOUR	±0.002 pH	5	USA, NIST, Euro, Custom	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 76
CyberScan PC 6500	pH/°C/°F/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity	±0.002 pH	5	USA, NIST, Euro, Custom	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 77
CyberScan pH 6500	pH/mV/Ion/°C/°F	±0.002 pH	5	USA, NIST, Euro, Custom	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 23
CyberScan PC 6000	pH/°C/°F/mV/ Conductivity/TDS/ Resistivity/Salinity	±0.002 pH	5	USA, NIST, Euro, Custom	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 78
CyberScan pH 6000	pH/mV/°C/°F	±0.002 pH	5	USA, NIST, Euro, Custom	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 24
CyberScan pH 1500	pH/mV/°C/°F	±0.002 pH	5	USA, NIST, Euro, Custom	–	100	Yes	IP54	RS232	Pg 25
CyberScan pH 2100	pH/mV/Ion/°C/°F	±0.002 pH	5	USA, NIST, Custom	Yes	100	Yes	IP54	RS232, Recorder	Pg 26
CyberScan pH 1100	pH/mV/°C/°F	±0.002 pH	5	USA, NIST, Custom	Yes	100	Yes	IP54	RS232, Recorder	Pg 26
CyberScan Ion 510	Ion/pH/mV/°C	±0.01 pH	5	USA, NIST	–	100	Yes	IP54	Recorder	Pg 27
CyberScan pH 510	pH/mV/°C	±0.01 pH	5	USA, NIST	–	100	Yes	IP54	Recorder	Pg 27

Conductivity Meter Quick Guide

Models	Parameters	Range	Accuracy	Cal. Points	GLP	Memory	Temperature Display	Housing Rating	Communication	Page No.
Pocket Testers										
ECTestr 11+	Conductivity/°C/°F	.. to 200.0 µS/cm .. to 2000 µS/cm .. to 20.00 mS/cm	±1 % Full scale	3 Auto 3 Manual	–	–	Yes	IP67	–	Pg 32
ECTestr 11	Conductivity/°C/°F	.. to 2000 µS/cm .. to 20.00 mS/cm	±1 % Full scale	2 Auto 2 Manual	–	–	Yes	IP67	–	Pg 32
Handheld Meters										
CyberScan PCD 650	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/°C/°F	.. to 500 mS/cm	±1 % Full scale + 1 LSD	4 Auto 5 Manual	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 68
CyberScan PC 650	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/°C/°F	.. to 500 mS/cm	±1 % Full scale + 1 LSD	4 Auto 5 Manual	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 69
CyberScan CD 650	Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/°C/°F	.. to 500 mS/cm	±1 % Full scale + 1 LSD	4 Auto 5 Manual	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 71
CyberScan COND 610	Conductivity/TDS/ Resistivity/Salinity/°C/°F	.. to 500.0 mS/cm	±1 % Full scale	4 Auto 5 Manual	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 34
CyberScan COND 600	Conductivity/TDS/°C/°F	.. to 200.0 mS/cm	±1 % Full scale	4 Auto 5 Manual	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 34
CyberScan CON 410	Conductivity/TDS/°C/°F	.. to 199.9 mS/cm	±1 % Full scale	5	Yes	50	Yes	IP67	–	Pg 35
CyberScan CON 400	Conductivity/°C/°F	.. to 199.9 mS/cm	±1 % Full scale	5	Yes	50	Yes	IP67	–	Pg 35
CyberScan CON 110	Conductivity/TDS/°C/°F	.. to 199.9 mS/cm	±1 % Full scale	5	–	100	Yes	IP54	RS232	Pg 36
CyberScan CON 11	Conductivity/TDS/°C	.. to 199.9 mS/cm	±1 % Full scale	5	–	50	Yes	IP54	–	Pg 36
EcoScan CON 6	Conductivity/°C	.. to 199.9 mS/cm	±1 % Full scale	5	–	–	Yes	IP54	–	Pg 37
Bench Meters										
CyberScan PCD 6500	pH/°C/°F/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/Dissolved Oxygen/BOD/OUR/SOUR	.. to 500 mS/cm	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 76
CyberScan PC 6500	pH/°C/°F/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity	.. to 500 mS/cm	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 77
CyberScan PC 6000	pH/°C/°F/mV/ Conductivity/TDS/ Resistivity/Salinity	.. to 500 mS/cm	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 78
CyberScan CON 6000	Conductivity/TDS/ Resistivity/Salinity/°C/°F	.. to 500 mS/cm	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 39
CyberScan CON 1500	Conductivity/TDS/ Resistivity/°C/°F	.. to 500 mS/cm	±1 % Full scale	4	–	100	Yes	IP54	RS232	Pg 40
CyberScan CON 510	Conductivity/TDS/°C/°F	.. to 200 mS/cm	±1 % Full scale	5	–	50	Yes	IP54	–	Pg 41

Meter Selection Guide

TDS Meter Quick Guide

Models	Parameters	Range	Accuracy	Cal. Points	GLP	Memory	Temperature Display	Housing Rating	Communication	Page No.
Pocket Testers										
TDSTestr 11+	TDS/°C/°F	.. to 200.0 ppm .. to 2000 ppm .. to 10.00 ppt	±1 % Full scale	2	–	–	Yes	IP67	–	Pg 32
TDSTestr 11	TDS/°C/°F	.. to 2000 ppm .. to 10.00 ppt	±1 % Full scale	3	–	–	Yes	IP67	–	Pg 32
Handheld Meters										
CyberScan PCD 650	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/°C/°F	.. to 500 ppt	±1 % Full scale + 1 LSD	5	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 68
CyberScan PC 650	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/°C/°F	.. to 500 ppt	±1 % Full scale + 1 LSD	5	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 69
CyberScan CD 650	Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/°C/°F	.. to 500 ppt	±1 % Full scale + 1 LSD	5	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 71
CyberScan COND 610	Conductivity/TDS/ Resistivity/Salinity/°C/°F	.. to 500 ppt	±1 % Full scale	5	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 34
CyberScan COND 600	Conductivity/TDS/°C/°F	.. to 200 ppt	±1 % Full scale	5	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 34
CyberScan CON 410	Conductivity/TDS/°C/°F	.. to 200 ppt	±1 % Full scale	5	Yes	50	Yes	IP67	–	Pg 35
CyberScan CON 110	Conductivity/TDS/°C/°F	.. to 200 ppt	±1 % Full scale	5	–	100	Yes	IP54	RS232	Pg 36
CyberScan CON 11	Conductivity/TDS/°C	.. to 200 ppt	±1 % Full scale	5	–	50	Yes	IP54	–	Pg 36
EcoScan TDS 6	TDS/°C	.. to 200 ppt	±1 % Full scale	5	–	–	Yes	IP54	–	Pg 37
Bench Meters										
CyberScan PCD 6500	pH/°C/°F/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/Dissolved Oxygen/BOD/OUR/SOUR	.. to 500 ppt	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 76
CyberScan PC 6500	pH/°C/°F/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity	.. to 500 ppt	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 77
CyberScan PC 6000	pH/°C/°F/mV/ Conductivity/TDS/ Resistivity/Salinity	.. to 500 ppt	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 78
CyberScan CON 6000	Conductivity/TDS/ Resistivity/Salinity/°C/°F	.. to 500 ppt	0.5 % Full scale + LSD	5	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 39
CyberScan CON 1500	Conductivity/TDS/ Resistivity/°C/°F	.. to 500 mS/cm	±1 % Full scale	4	–	100	Yes	IP54	RS232	Pg 40
CyberScan CON 510	Conductivity/TDS/°C/°F	.. to 200 ppt	±1 % Full scale	5	–	50	Yes	IP54	–	Pg 41

DO Meter Quick Guide

Models	Parameters	Range	Accuracy	Cal. Points	GLP	Memory	Barometric / Salinity Compensation	Housing Rating	Communication	Page No.
Handheld Meters										
CyberScan PCD 650	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/°C/°F	0.00 to 90.00 mg/L or ppm	±0.2 mg/L	1 (mg/L)	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 68
CyberScan PD 650	pH/mV/Ion/Dissolved Oxygen/°C/°F	0.00 to 90.00 mg/L or ppm	±0.2 mg/L	1 (mg/L)	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 70
CyberScan CD 650	Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/°C/°F	0.00 to 90.00 mg/L or ppm	±0.2 mg/L	1 (mg/L)	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 71
CyberScan DO 600	Dissolved Oxygen/°C/°F	0 to 600 %, 0 to 90 mg/L	±2 %, ±0.2 mg/L	2 (0 %, 100 %) 1 (mg/L)	Yes	500	Yes	IP67	LED RS232, IrDA	Pg 47
CyberScan DO 300	Dissolved Oxygen/°C/°F	0 to 199.9 %, 0 to 19.99 mg/L	±1.5 % Full scale	2 (0 %, 100 %) 1 (mg/L)	Yes	50	Yes	IP67	–	Pg 48
CyberScan DO 110	Dissolved Oxygen/°C/°F	0 to 199.9 %, 0 to 19.99 mg/L	±1.5 % Full scale	2 (0 %, 100 %) 1 (mg/L)	–	100	Yes	IP54	RS232	Pg 49
EcoScan DO 6	Dissolved Oxygen/°C	0 to 199.9 %, 0 to 19.99 mg/L	±1.5 % Full scale	2 (0 %, 100 %) 1 (mg/L)	–	–	Yes	IP54	–	Pg 50
Bench Meters										
CyberScan PCD 6500	pH/°C/°F/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/ BOD/OUR/SOUR	0 to 600 %, 0 to 60 mg/L 0 to 1272 mbar	0.1 % 0.1 +1 LSD 0.1 mbar	2 (0 %, 100 %) 2 (0 mg/L, 8.26 mg/L)	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 76
CyberScan DO 6000	Dissolved Oxygen/BOD/ OUR/SOUR/°C/°F	0 to 600 %, 0 to 60 mg/L 0 to 1272 mbar	0.1 % 0.1 +1 LSD 0.1 mbar	2 (0 %, 100 %) 2 (0 mg/L, 8.26 mg/L)	Yes	1000 Per parameter	Yes	IP54	RS232, USB, IrDA	Pg 52
CyberScan DO 1500	Dissolved Oxygen/°C/°F	0 to 600 %, 0 to 60 mg/L	±0.5 % Full scale +1 LSD	2 (0 %, 100 %) 1 (mg/L)	–	100	Yes	IP54	RS232	Pg 53

Colorimeter Quick Guide

Parameters	Range	Resolution	Accuracy	C401	C301	C201	C105	C104	C103	C102	C101	Page No.
Chlorine, Free and Total	0 - 1.99 ppm	0.01 ppm	±0.02 ppm	✓	✓	✓	–	–	–	–	–	Pg 61
	2.0 - 6.0 ppm	0.1 ppm	±0.2 ppm									
Cyanuric Acid	5 - 90 ppm	1 ppm	±4 ppm	✓	–	–	–	–	–	✓	–	
pH	5.9 - 8.2 pH	0.1 pH	±0.1 pH	✓	✓	–	–	–	–	–	✓	
Chlorine Dioxide	0 - 3.79 ppm	0.01 ppm	±0.02 ppm	–	–	–	–	–	✓	–	–	
	3.8 - 11.4 ppm	0.1 ppm	±0.2 ppm									
Bromine	0 - 4.49 ppm	0.02 ppm	±0.03 ppm	–	–	–	–	✓	–	–	–	
	4.5 - 13.5 ppm	0.2 ppm	±0.3 ppm									
Ozone	0 - 1.39 ppm	0.01 ppm	±0.02 ppm	–	–	–	✓	–	–	–	–	
	1.4 - 4.1 ppm	0.1 ppm	±0.2 ppm									

Look Out for These Features in Eutech Meters			
CE	CE-certified products.	ATC	Automatic Temperature Compensation automatically corrects the measured value based on the temperature of the solution with the use of a built-in temperature sensor.
IP67	IP67-rated housing offers complete protection against dust and allows immersion in water between 15 cm to 1 m.	MTC	Manual Temperature Compensation is an alternative method for temperature compensation through the manual input of sample temperature value.
IP54	IP54-rated housing protects instrument from dust and water spray from all directions.	AUTO-CAL	Automatic Calibration frees users from cumbersome fine adjustment or manual selection of desired standards in Conductivity and Dissolved Oxygen calibration routine.
2 Year Warranty	Pocket testers, colorimeters and turbidity meters are covered by Eutech warranty for 2 years.	AUTO-BUFFER	Auto-Buffer Recognition identifies and ensures correct pH buffer values are being used during calibration.
3 Year Warranty	Handheld meters and bench meters are covered by an extended warranty for 3 years.	GLP	Good Laboratory Practices (GLP) refers to regulations that are observed to ensure high quality experimental standards and reliable data.
		RS232	RS232 cable output for serial communication between meters and PC or other peripheral devices.
		IrDA	Infrared communications technology for wireless data transfer from meter to PC or other peripheral devices.

pH : :

The measure of acidity or alkalinity of a liquid.

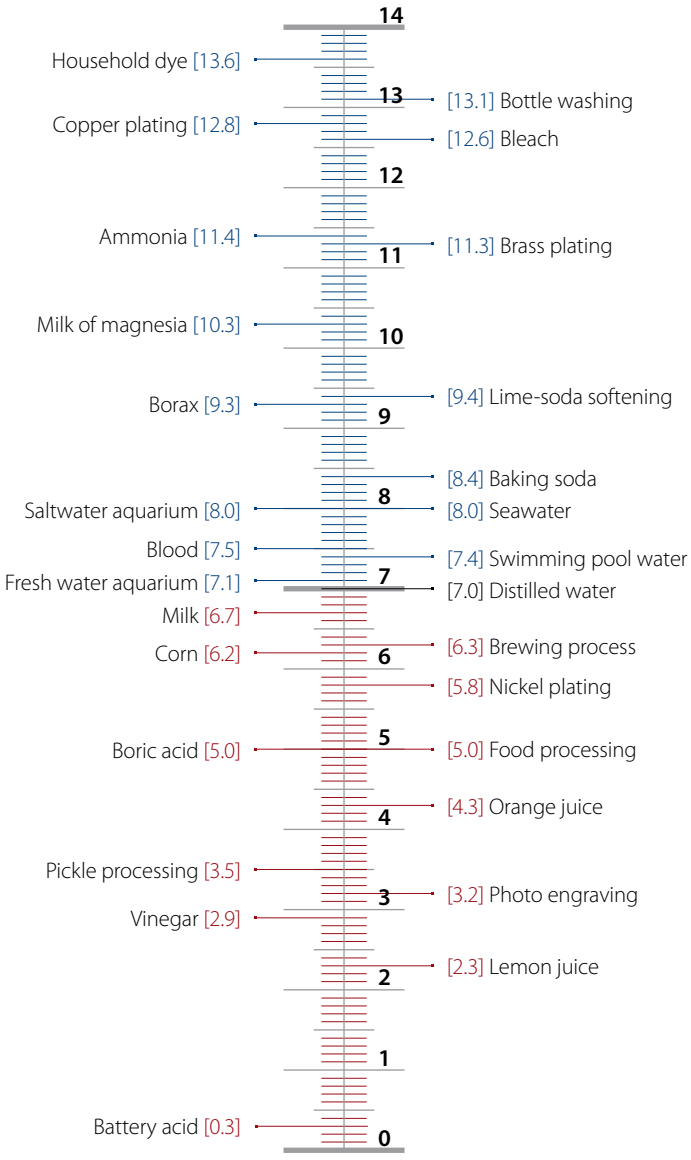
About pH Measurement

Why is pH Important?

pH is the measure of acidity and alkalinity of a liquid. It is one of the most common parameters measured in a wide variety of industries ranging from water and wastewater treatment, chemical production, agriculture research and production, environmental monitoring, chemical and life sciences research, biochemical and pharmaceutical research, electronics production to food processing and other industrial applications.

For instance, the level of pH is crucial during the manufacture of sugar. An inappropriate pH level can result in the formation of unwanted acids and very little sugar. pH control is also important in sewage treatment management as it is undesirable to pollute sewers with highly acidic or alkaline spills.

Here are examples of pH in a few common industrial and household products:



pH Theory

pH is the measure of how acidic or alkaline a substance is on a scale of 0 to 14. pH values below 7 represent the acidic half of the scale; pH values above 7 represent the alkaline or basic half of the scale. The pH value 7 is neutral, i.e. neither acidic nor alkaline.

pH can be defined by the following equation:

$pH = -\log [H_3O^+]$

Where $[H_3O^+]$ = The concentration in Moles/litre of the hydronium ion in solution.

In pure water, the H_3O^+ ion concentration is 1×10^{-7} Moles/litre. Using the formula definition above, pH value of pure water is derived as follows:

pH value of pure water $= -\log [1 \times 10^{-7}] = 7$

There is an equal concentration of H_3O^+ ions and OH^- ions in pure water at 25 °C. The equilibrium constant, Kw of water, is the product of the H_3O^+ ion and OH^- ion concentrations:

$Kw = [H_3O^+] [OH^-]$

Hence,

Kw of pure water is $= [1 \times 10^{-7}] [1 \times 10^{-7}] = 1 \times 10^{-14}$

The Kw of water must remain constant. Therefore, an increase in either the H_3O^+ ions or OH^- ions will result in a decrease of the other ions, resulting in acidity (increased H_3O^+) or alkalinity (increased OH^-).

pH Measurement

pH is always measured across a medium.

Although the litmus paper is one of the most common methods of pH measurement, it can only provide a rough indication which might be insufficient in most applications.

The more accurate method involves the use of a measurement system that consists of a pH meter and a pH electrode that has a hydrogen ion sensitive glass bulb. The most common sensing element used in the electrode is the glass membrane as it is selective for H+ ions i.e. H+ ions can permeate through the hydrated layer of glass membrane. However the electrode body may not necessarily be glass.

The movement of ions into the hydrated membrane changes the electrochemical effect inside the glass which is measured in mV and then converted via the pH meter to be reflected as a pH value.

Hence depending on the concentration of ions in the solution, the mV and hence pH varies.

The performance of an electrode is dependent on two parameters – Offset and Slope.

Offset in pH Electrode

Theoretically, when placed in pH 7.00 buffer at 25 °C, a pH electrode produces 0 mV which the pH meter reads as 7.00 pH. The difference between 0 mV and the electrode's actual reading is called the offset error which can be as high as ±25 mV.

In other words, when the electrode is not in measurement or in pH 7 buffer solution, the output (or reading) will be known as the offset.

While in theory, the mV value should be zero, however in practice this is rarely the case because of the following reasons:

- Liquid difference
- Bulb composition
- Wire geometry difference and other factors

In practice, it is unrealistic to achieve zero offset in electrodes. The Eutech range of advanced micro-processor based meters provides offset calibration abilities for consistent and reliable measurements.

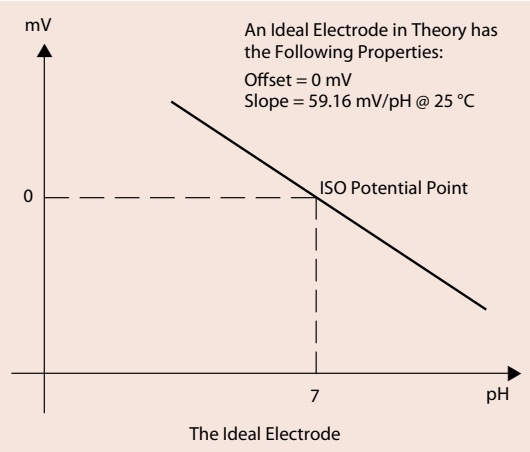
Slope in pH Electrode

As explained earlier the pH electrode produces different mV in different solution.

The slope of the electrode is defined as
Slope = mV/pH unit

A perfect pH electrode, at 25 °C, produces a slope of 59.16 mV per pH unit. For example, for an electrode with 0 mV offset, when placed in a solution other than pH 7.00, say pH 4.01, it should read mV value of 177.48 mV. Therefore the slope is calculated to be (177.48 mV - 0 mV) / 3 pH = 59.16 mV/pH. The difference between this perfect slope reading and the electrode's actual reading is called the slope error.

These theoretical values are not always achieved, even with brand new electrodes. New pH electrode slope should be between 92 % and 102 % of 59.16 mV. If the slope falls below 92 %, cleaning of the electrode may be needed.



The Ideal Electrode

Temperature Compensation

In a perfect pH electrode – one that is zeroed at exactly pH 7 – there is no temperature effect on the electrode sensitivity at pH 7 no matter how much the temperature changes. Most pH electrodes are not perfect, but the errors from changes in temperature are still very minute when near pH 7, plus or minus one-tenths of a pH, and can be disregarded. However, the further from pH 7 the solution is and the greater the temperature changes, the greater the measurement error due to changes in the electrode's sensitivity. For most electrodes, the error will be 0.003 pH/°C/pH away from pH 7.

For example, if a pH meter is calibrated at room temperature (25 °C) and is measuring a sample around pH 4 at around 5 °C.

Temperature difference: 25 °C - 5 °C = 20 °C
pH away from neutral: 7 pH - 4 pH = 3 pH
Total error: 0.003 x 20 x 3 = 0.18 pH

To overcome this error, pH meters require some form of temperature compensation to ensure standardized pH values. Meters and controllers with Automatic Temperature Compensation (ATC) receive a continuous signal from a temperature sensing element and automatically correct the pH value based on the temperature of the solution. Manual Temperature Compensation requires the user to enter the temperature of the solution in order to correct pH readings for temperature. ATC is considered to be more practical for most pH applications.

Most Eutech meters offer ATC capabilities. Models with this feature include the pHTestr™10, 20, 30 and all the EcoScan, CyberScan handheld and bench pH meters.

More on pH Electrodes

The electrode system consists of two half cells: a pH indicating electrode, which is primarily responsive to the acidity (the hydronium ion concentration) of a solution, and a reference electrode, which provides a constant voltage and completes the electrical circuit.

pH indicating electrodes traditionally use a tip made of pH sensitive glass. Inside this electrode is a buffer solution with a fixed pH and ionic strength. A silver wire coated with silver chloride is immersed inside this internal solution, and establishes electrical contact between the solution and the meter. The voltage associated with this wire and the voltage associated with the pH of the internal solution and the inside wall of the pH sensitive glass tip remain constant. Therefore, changes in voltage from this electrode result from the voltage developed between the solution and the outside of the glass tip.

Reference electrodes typically consist of three elements: an internal reference electrode, a filling solution, and a reference junction through which the filling solution can "flow", and provide electrical contact with the sample and the internal reference electrode. The most convenient internal reference electrodes are made from a metal (such as silver or mercury) and its sparingly soluble salt (silver chloride or mercurous chloride). The filling solution is most often a concentrated solution of potassium chloride. Most problems with reference electrodes are associated with the interruption or blockage of flow of the potassium chloride fill solution through the reference junction.

Single and Double Junction Electrodes

For many applications, a single junction reference electrode is satisfactory. However, if samples contain proteins, sulfides, heavy metals or any other material which interacts with silver ions, unwanted side reactions may occur. These reactions can lead to erroneous reference signals or to precipitation at the reference junction leading to a short service life.

A double junction reference design affords a barrier of protection to combat the above interactions. When in doubt about using single or double junction designs, the safest approach is to use the double junction as they can be used anywhere a single junction design can be used. Conversely, single junction designs should not be used where double junction designs are needed. In most process applications, it is recommended to use double junction electrodes.

Eutech's new range of large screen pocket testers pHTestr™ series feature double junction electrodes that extend useful life and provide long term cost savings for users.

Normal Aging

As electrodes are used or stored for long periods they will experience some deterioration in performance. Offsets will change and slope error will increase. By using the calibration controls these errors can be corrected. If an electrode is able to be calibrated and is stable and responsive, it is still a functional electrode and may be used in service even though it no longer meets "new" electrode specifications.

Storage/Shelf Life

pH electrodes have a limited shelf life. Therefore, it is important to have a backup electrode. It is important to ensure that the spare electrode is in working condition when required. Electrodes supplied with soaker storage bottles with special soaker solutions have longer shelf life than those supplied dry with small caps.

Most Eutech pH electrodes are supplied with storage solutions for extended electrode life.

A dry or dehydrated electrode membrane will not respond properly to changes in acidity. The special solution in soaker bottles provides an environment that maintains pH glass hydration in an acidic environment and keeps the reference junction wet. If the original solution is no longer available, the following are acceptable storage media for pH electrodes in order of preference:

- 4.00 pH Buffer
- 7.00 pH Buffer

Other pH buffers or tap water are also acceptable storage media, but avoid storage in deionised water.

Note: When pH electrodes are stored in deionised water, ions from pH glass membranes and reference junction solution are consumed by the deionised water. Deionized water should only be used for rinsing.

Electrode Maintenance

pH electrodes are susceptible to dirt and contamination and need to be cleaned regularly depending on the extent and condition of use. Wash the electrode and reference junction quickly in deionised water. Close the refilling hole by returning its rubber sleeve or stopper cap (necessary for only refillable electrodes). Store the electrode as mentioned above, or as recommended by the manufacturer.

Electrolyte Replacement (For Refillable Electrodes only)

The reference electrolyte needs to be refilled when the electrode has been used for an extended period, or when the internal electrolyte has dried up. The old reference electrolyte can be removed with a syringe and a flexible tube and replaced with a fresh electrolyte as recommended for the electrode.

Electrode Cleaning

Electrodes that are mechanically intact can be restored to normal performance by the following procedures.

a Salt Deposits
Dissolve the deposit by immersing the electrode in tap water for 10 to 15 minutes. Then rinse with deionised water.

b Oil/Grease Films
Wash electrode pH glass in a little detergent and water. Rinse electrode tip with deionised water.

c Clogged Reference Junction
Heat a dilute KCl solution to 60 - 80 °C. Place the sensing portion of the pH electrode into the heated KCl solution for approximately 10 minutes. Allow the electrode to cool while immersed in pH 4.01 buffer solution.

d Protein Deposits
Prepare a 1 % pepsin solution in 0.1M HCl. Allow the electrode to stand in this solution for five to ten minutes. Rinse the electrode with deionised water.

About ORP Measurement

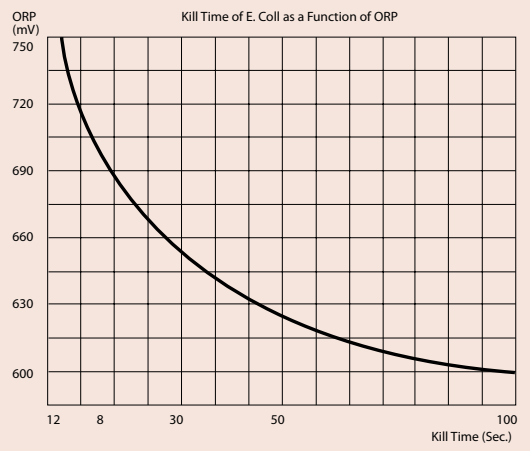
ORP – Oxidation Reduction Potential

Oxidation-Reduction Potential (ORP) or Redox Potential measurements are used to monitor chemical reactions, to quantify ion activity, or to determine the oxidizing or reducing properties of a solution. ORP is a measurement of the electrical potential of a redox reaction and serves as a yardstick to judge how much oxidation or reduction takes place under existing conditions.

ORP electrodes measure the voltage across a circuit formed by the measuring metal half cell and the reference half cell. When the ORP electrode is placed in the presence of oxidizing or reducing agents, electrons are constantly transferred back and forth on its measuring surface, generating a tiny voltage. The ORP measurement can be made using the millivolt mode of a pH meter.

Major areas of usage include the treatment of industrial wastes, study of biological systems, oxidation of cyanide, bleaching of pulp, manufacture of bleach and reduction of chromate wastes.

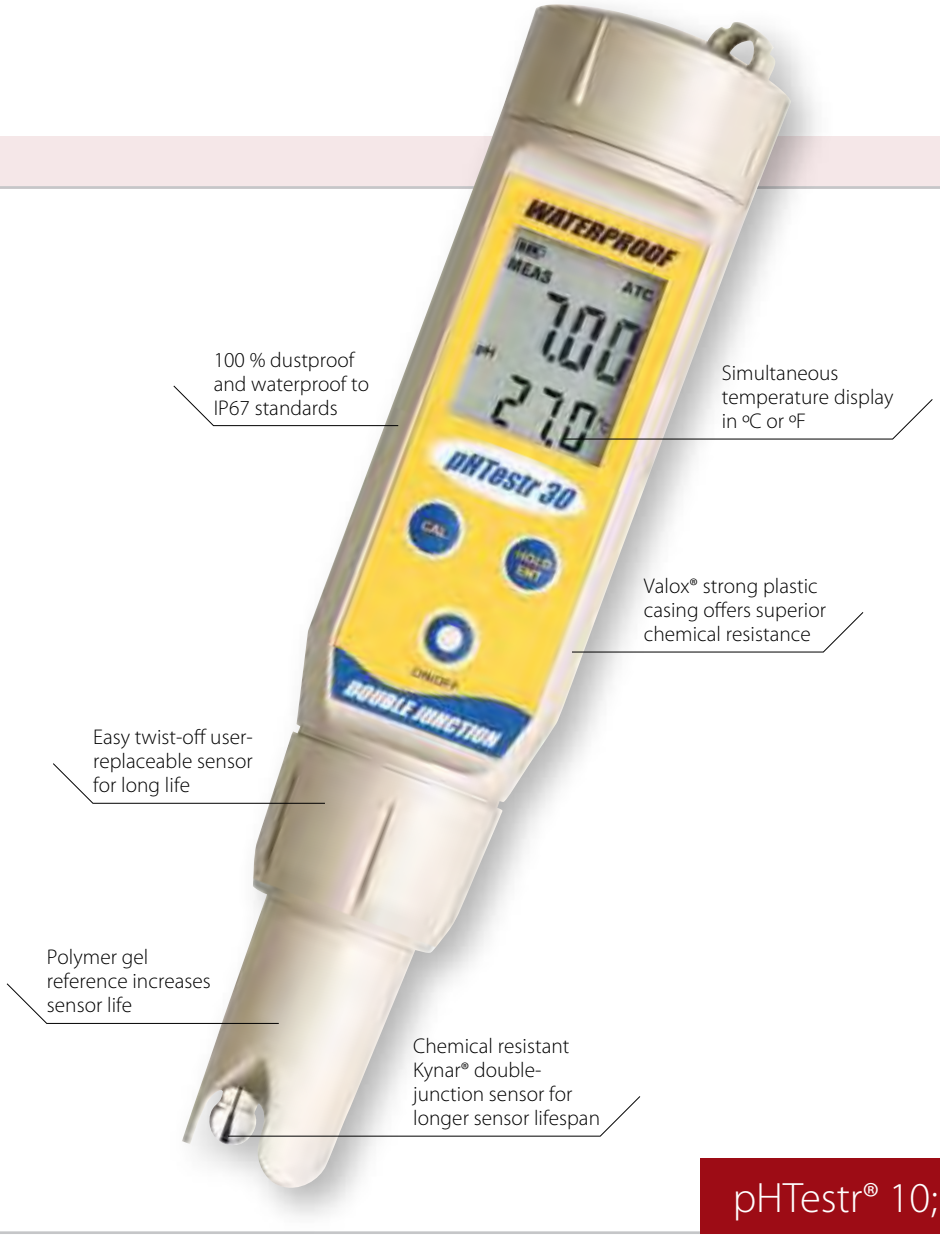
The measurement of ORP is also useful in pool water treatment as an indication of sanitation in relation to free chlorine parameter. ORP technology has gained recognition worldwide and is found to be a reliable indicator of bacteriological water quality. The table below illustrates the Kill Time of E.Coli bacteria as a function of ORP value. With a value of 600 mV, the life of the bacteria is almost 2 minutes; at 650 mV it reduces to 30 seconds. Above 700 mV the bacteria is killed within a few seconds. It is therefore necessary for the water to have an ORP value of at least 700 mV to ensure good water quality.



ORP value also depends on the pH of pool water. Normal values lie between 7.2 and 7.6 pH with a tendency to increase to around 8.0 to 9.0 pH depending on the level of contamination. The pH of the pool water has to be maintained at the optimum level between 7.2 and 7.6 pH by dosing appropriate chemicals. If the pH of the swimming pool water is acceptable and the ORP value is below 700 mV, hypochlorite or other oxidising chemicals should be added.

Eutech offers a wide range of meters that measure both pH and ORP values in various educational, laboratory and industrial applications. These include ORPTestr™ 10 pocket tester, handheld meters CyberScan Series pH 300, pH 310, pH 11 and pH 110, EcoScan pH 6 and the CyberScan bench meter series 510, 1100, 2100, 1500 and the colour touchscreen research-grade series 6000.

pH measurement has never been easier with the Eutech pHTestr® series pocket testers. Accurate, handy and user-friendly, the pHTestr 10, 20 and 30 are the longest lasting pocket testers.


100 % dustproof and waterproof to IP67 standards
Simultaneous temperature display in ºC or ºF
Valox® strong plastic casing offers superior chemical resistance
Easy twist-off user-replaceable sensor for long life
Polymer gel reference increases sensor life
Chemical resistant Kynar® double-junction sensor for longer sensor lifespan
WATERPROOF
pHTestr 30
DOUBLE JUNCTION

Large custom dual-display LCD

Ribbed body for better grip

User-replaceable sensor

pHTestr® 10; pHTestr® 20; pHTestr® 30

pH ; pH ; pH/ºC/ºF

High Accuracy
- Up to ±0.01 pH accuracy at 0.01 pH resolution
- 3-point push-button calibration with 5 buffer option sets – quick, easy calibration with no mistakes
- Automatic Temperature Compensation (ATC) – accurate readings even in varying conditions

Long Lasting
- Double-junction sensor with chemical resistant Kynar® porous junction minimizes clogging and contamination
- Longer electrode lifespan with increased polymer gel volume
- Rugged and waterproof to IP67 standards. So light, it floats!

User-Friendly
- Large custom dual display LCD
- Calibration settings remain, even when tester runs out of batteries
- Simultaneous temperature display in ºC and ºF *

** For pHTestr 30*

ATC | AUTO-BUFFER | 2 YEAR WARRANTY | IP67 | CE

Applications

General: *Quick and accurate checks in pools and spas, aquariums and hydroponics operations, or anywhere frequent pH testing is required.*

Industrial: *Cooling towers, food processing, water and wastewater treatment, photo-development, printing and chemical industries.*

Educational: *Useful for most laboratory, ecological studies and other applications.*

pHTestr™ 10BNC

pH

The versatile pHTestr™ 10BNC comes with a BNC electrode connection that allows tester to be used with a wide range of specialty electrodes with various cable lengths – especially useful in inaccessible areas such as cooling towers or large drums used in yoghurt production.

Applications

General: *Quick and accurate checks in pools and spas, aquariums and hydroponics operations, or anywhere frequent pH testing is required.*

Industrial: *Cooling towers, food processing, water and wastewater treatment, photo-development, printing and chemical industries.*

Educational: *Useful for most laboratory, ecological studies and other applications.*

- User-selectable electrodes with BNC connectors
- Up to ±0.01 pH accuracy at 0.01 pH resolution
- Non-volatile memory holds your tester settings, even when batteries run out
- 3-point push-button calibration with 5 buffer option sets – quick, easy calibrations with no mistake
- Advance power management – 500 hours of operation on one set of batteries
- Large custom dual-display LCD
- Waterproof to IP67 standard. So light, it floats!

Specially designed for food applications, the Eutech pH Spear allows direct pH measurement of solid or semi-solid samples like cheese, fruits and meat. A tough spear tip open pore sensor, ideal for measuring pH samples such as cheese, meats, fruits and soil.

Large custom dual-display

Open pore reference junction minimises clogging and delivers fast, stable measurements

Tough open pore spear tip

Double-junction sensor prevents contamination of sample

Meat

Fruit and cheese

Soil

pH Spear

pH

- Open pore spear tip sensor with MTC – tough, fast, stable and minimizes clogging
- Double junction sensor prolongs electrode lifespan without contaminating samples
- Up to ±0.01 pH accuracy at 0.01 pH resolution
- Non-volatile memory holds your tester settings, even when you run out of batteries
- 3-point push-button calibration with 5 buffer option sets – quick, easy calibrations with no mistake
- Advance power management – 500 hours of operation on one set of batteries
- Waterproof to IP67 standard

MTC | AUTO-BUFFER | CE

Applications

• Bread • Meat • Cheese • Salami • Ice-cream • Poultry • Fruits • Other dairy products • Soil • Other similar samples

Fast, stable and precise – the Eutech's ORPTestr™ 10 is designed with advance microprocessor technology to give you up to ±2 mV accuracy across a wide measuring range. User-replaceable double-junction sensor with a wide platinum band provides highly accurate results, even in wet and rugged environments.

ORPTestr™ 10; ORPTestr™ 10BNC

ORP (mV)

ORPTestr™ 10BNC enables a wider range of specialty electrodes to be used

Applications

• Chromate reduction • Cyanide oxidation • Swimming pool water • Pulp bleaching • Cooling towers • Aquaculture • Drinking water • Other redox applications

More Accurate
- ±2 mV full scale accuracy
- Wide range of -999 to 1000 mV

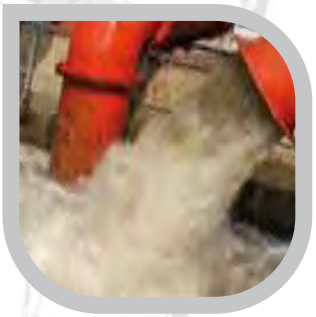
More Savings
- Replaceable double-junction Ag/AgCl polymer sensor
- Advance power management – 500 hours of operation on one set of batteries

More User-Friendly
- Large custom display LCD
- Non-volatile memory stores your tester settings, even when you run out of batteries
- Waterproof to IP67 standard. So light, it floats!

pH/ORP Pocket Testers Specifications		**pHTestr 30**	**pHTestr 20**	**pHTestr 10**	**pHTestr 10BNC**	**pHSpear**	**ORPTestr 10**	**ORPTestr 10BNC**
Measuring Parameter		pH/°C/°F	pH				ORP (mV)	
Highlights		0.01, Temp. display	0.01 Resolution	0.1 Resolution	BNC connection	Open pore, spear tip	Platinum band sensor	BNC connection
pH/mV	Range	-1.00 to 15.00 pH		-1.0 to 15.0 pH	-1.00 to 15.00 pH		-999 to +1000 mV	
	Resolution	0.01 pH		0.1 pH	0.01 pH		1 mV	
	Accuracy	±0.01 pH		±0.1 pH	±0.01 pH		±2 mV	
	Calibration Points	3 Auto					1 Manual	
	Buffer Sets	USA: 4.01/7.00/10.01 ; NIST: 4.01/6.86/9.18					–	
Temperature	Range	0 to 50.0 °C 32.0 to 122.0 °F	–		0 to 50.0 °C 32.0 to 122.0 °F (MTC)		–	
	Resolution	0.1 °C/°F	–		0.1 °C/°F		–	
	Accuracy	±0.5 °C/0.9 °F	–					
	Calibration Window	±5 °C/9 °F from default value	–					
Meter Functions	ATC	Yes			No (MTC)		No	
	Sensor Type	Double-junction			BNC	Double-junction		BNC
	Non-Volatile Memory	Yes						
	Auto-Off	8.5 Mins after last key pressed						
	Operating Temp.	0 to 50 °C						
	LCD Display	Custom dual-display 2.7 cm (H) x 2.1 cm (W)						
	Power	4 x 1.5 V "A76" Micro alkaline batteries						
	Battery Life	> 500 Hours					> 250 Hours	
Dimensions (LxWxH) ; Weight	Tester	16.5 x 3.8 cm ; 90 g				24 x 3.8 cm ; 103 g	16.5 x 3.8 cm ; 90 g	
	Boxed	22 x 6 x 5 cm ; 170 g				25.5 x 13.5 x 7.5 cm ; 240 g	22 x 6 x 5 cm ; 170 g	

Order Code	**Part No.**	**Description**
PHTEST30	01X366903	Waterproof pHTestr 30 with ATC & temperature display
PHTEST20	01X366902	Waterproof pHTestr 20 with ATC
PHTEST10	01X366901	Waterproof pHTestr 10 with ATC
PHTEST10BNC	01X366914	Waterproof pHTestr 10BNC
PHSPEAR	01X366919	Waterproof pHSpear
ORPTEST10	01X366909	Waterproof ORPTestr 10
Accessories		
PHSENSOR03DJ	01X106709	Double junction sensor for pHTestr 10, 20, 30
PHSENSORBNC	01X106720	BNC connector sensor for pHTestr 10BNC & ORPTestr 10BNC
PHSENSOR04	01X106724	Double junction spear-tip electrode for pHSpear
ORPSENSORDJ	01X106711	Double junction sensor for ORPTestr 10
ECPOUCH01	56X201300	Carrying pouch for pocket tester
ECBATT14	01X220401	Alkaline button cell batteries (50 units per pack)

<< Swimming Pools
>> Wastewater Treatment



Featuring a large, comprehensive screen with simultaneous display of electrode status, calibration information, temperature and pH or ion measurements at 3-digit resolution! The CyberScan pH 600 also comes with advanced wireless communication technology – no wires, no cables. Simply send data from meter to PC with the press of a button.

CyberScan pH 600; CyberScan pH 610; CyberScan pH 620

pH/mV/ºC/ºF ; pH/mV/ºC/ºF ; pH/mV/Ion/ºC/ºF

Electrode inputs

Wireless data transfer

Waterproof external power input

Data acquisition software included

Higher Resolution & Accuracy
- High accuracies of up to ±0.002 at resolution expandable to 3-decimal places
- Cal-due alarm prevents out-dated calibrations
- Set-points function for quality control check – meter warns when readings fall outside set limit

Fuss-Free Data Management
- Mega-memory stores up to 500 data sets in GLP-compliant format
- RS232 through LED*, IrDA wireless communications technology

More User-Friendly
- Intuitive operation via soft-keys and diagnostic prompt messages for easy trouble-shooting
- 20 buffer options with custom and auto buffer recognition
- Clear indication of electrode status with electrode properties report & response indicator
- Password protection security for calibration and set-up menus

** RS232 (LED) interface adapter available as separate accessory (order code: 01X344201)*

ATC MTC GLP AUTO-BUFFER IrDA RS232

Applications

• Surface water analysis • Water & wastewater treatment • Boiler blow-down • Electroplating rinse tanks • Drinking water • Hydroponics • Printing Industry • Swimming pools • Others

CyberScan pH 300 and pH 310 are IP67 waterproof and ergonomically designed for the rigours of field measurements and demands of laboratory applications.

Ergonomic design

Rubber sleeve for improved waterproofing

Adjustable probe holder

Available as a complete kit version

CyberScan pH 300; CyberScan pH 310

pH/mV/ºC ; pH/mV/ºC/ºF

- Waterproof to IP67 standard
- Additional security against water with rubber sleeve at connector
- Up to 5-point push button calibration
- Selectable automatic/manual temperature compensation
- Dual-display shows pH & temperature readings simultaneously
- Other features include: Custom dual display LCD, user-customisation on advanced setup mode, auto-off, HOLD function, self-diagnostics, electrode status display

Expanded Features of CyberScan pH 310

- GLP-compliant date/time stamping
- Up to 6-point push button calibration with DIN buffer set
- Selectable ºC/ºF
- Extended memory – 50 data sets
- Auto-hold function

ATC MTC GLP AUTO-BUFFER

Applications

Industrial: *Ideal for checks in water conditioning plants, cooling towers, plating and finishing operations, food processing water testing (e.g. HACCP compliance), printing, chemical, manufacturing and water/wastewater treatment.*

Educational: *Useful for most laboratory, ecological studies and other applications.*

Laboratory: *Use in all types of food processing, environmental studies, chemical labs, titrations and quality assurance testing, where GLP data-management is required.*

User-friendly with advanced features, the CyberScan pH 11 and 110 come in sturdy IP54-rated housing to protect against incidental splashes. The standard handhelds are self-diagnostic for easy trouble-shooting and designed to fit your palm perfectly for effortless one-hand operation.

CyberScan pH 11; CyberScan pH 110

pH/mV/ºC ; Ion/pH/mV/ºC

Rubber sleeve for splash protection

RS232C output to printer or computer with DAS

Available as a complete kit version

- Up to 5-point push-button calibration and auto-buffer recognition for quick, easy calibration with minimal mistake
- Selectable automatic/manual temperature compensation
- Hold function freezes readings for easy reference
- Auto-off conserves energy and lengthens battery life-span
- Easy troubleshooting with comprehensive self-diagnostic messages

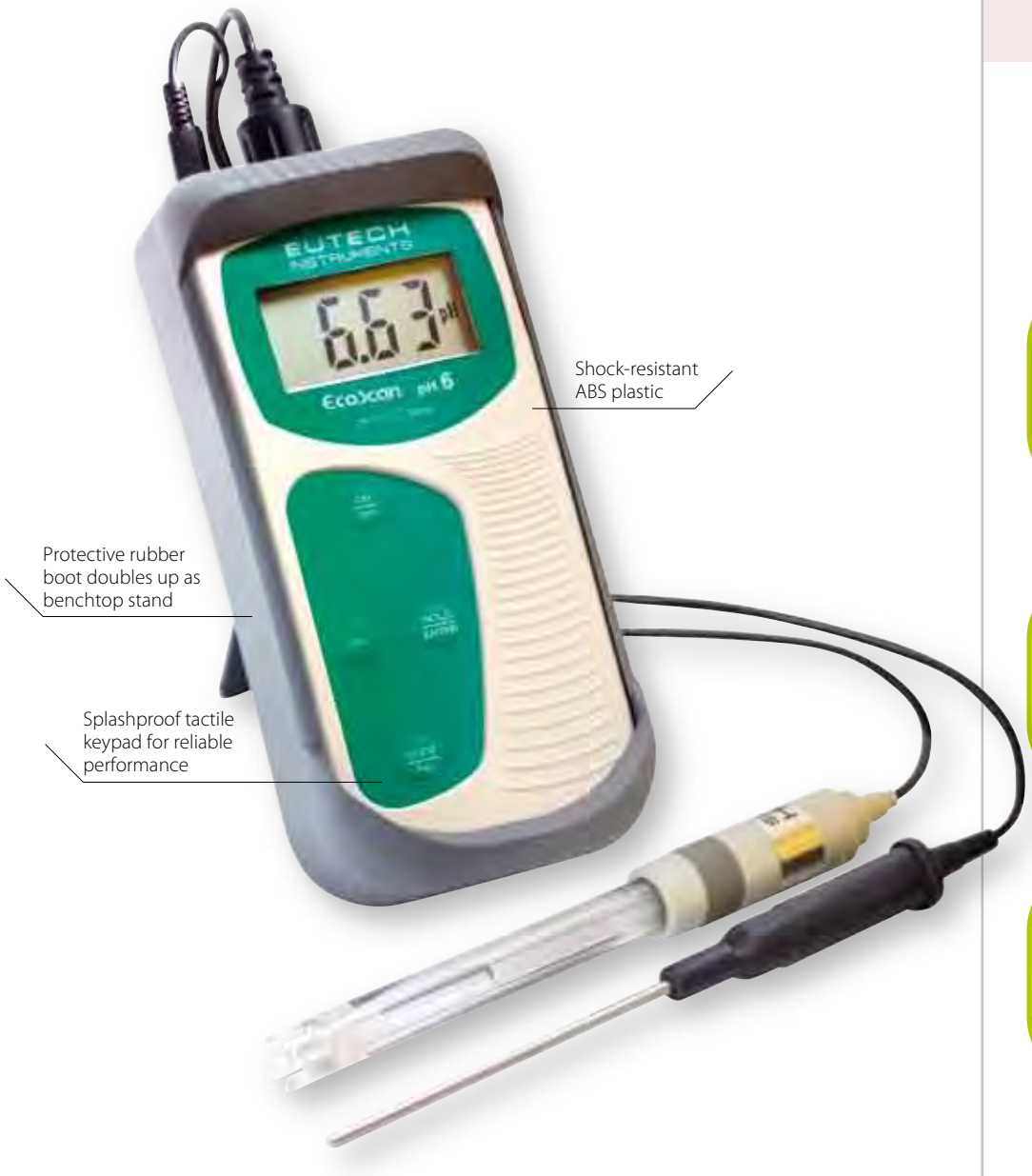
Applications

• Food processing • Water & wastewater treatment • Cooling towers • Printing • Ponds & aquariums • Agriculture & hydroponics • Education institutions • Electroplating operations (use with ORP electrode)

Expanded Features of CyberScan pH 110

- Selectable °C/°F
- Up to 6-point push-button calibration with DIN buffer set
- Convenient data transfer to a printer or PC with RS232 output
- Expanded memory stores up to 100 data sets

Eutech EcoScan pH 5, pH 6 and Ion 6 offer you the greatest value-for-money for basic pH and ion measurement needs. Rugged and user-friendly, these no-frill meters come with protective rubber boots that conveniently double up as benchtop stands – great for the lab and the field.


Shock-resistant ABS plastic
Protective rubber boot doubles up as benchtop stand
Splashproof tactile keypad for reliable performance

EcoScan easy view

Rubber boot with hinge

Available as a complete kit version

EcoScan™ pH 5; EcoScan™ pH 6; EcoScan™ Ion 6

pH/ºC ; pH/mV/ºC ; Ion/pH/mV/ºC

- 3-point push-button calibration with auto-buffer recognition and choice of USA, NIST and pure water buffer option sets – quick, easy calibration with no mistakes
- Accuracy of up to ±0.01 pH and ±0.5 °C
- Automatic Temperature Compensation (ATC)
- Non-volatile memory holds your settings, even when meter runs out of batteries
- Hold function freezes readings for easy reference
- Auto-off conserves energy and lengthens battery life-span
- Easy troubleshooting with comprehensive self-diagnostic messages

Applications

General: *Ideal for checks in pools and spas, aquariums and hydroponics operations, or anywhere water quality is a concern.*

Industrial: *Cooling towers, food processing, water and wastewater treatment, photo-development, printing and chemical industries.*

Educational: *Useful for most laboratory, ecological studies and other applications.*

pH/ORP Handheld Meters Specifications		CyberScan Dual-Display							EcoScan Single-Display		
		pH 620	**pH 610**	**pH 600**	**pH 310**	**pH 300**	**pH 110**	**pH 11**	**Ion 6**	**pH 6**	**pH 5**
Measuring Parameter		pH/mV/Ion/°C/°F	pH/mV/°C/°F			pH/mV/°C	pH/mV/°C/°F	pH/mV/°C	Ion/pH/mV/°C	pH/mV/°C	pH/°C
Highlights		Waterproof, GLP, RS232, IrDA, Ion	Waterproof, GLP, RS232, IrDA, 0.001 pH	Waterproof, GLP, RS232, IrDA, 0.01 pH	Waterproof, GLP	Waterproof handheld	Expanded memory, RS232 output	Standard handheld	Economical Ion, pH, ORP measurement	Economical pH, ORP measurement	Economical pH measurement
pH	Range	-2.000 to 20.000 pH		-2.00 to 20.00 pH	-2.00 to 16.00 pH				0.00 to 14.00 pH		
	Resolution	0.1/0.01/0.001 pH		0.1/0.01 pH	0.01 pH						
	Accuracy	±0.002 pH		±0.01 pH	±0.01 pH						
	Calibration Points	1 (Offset) to 6 points			Up to 6 (using DIN)	Up to 5	Up to 6 (using DIN)	Up to 5	Up to 5		
	Buffer Sets	USA, NIST, DIN, PWB, Custom			USA, NIST, DIN	USA	USA, NIST, DIN, PWB	USA, NIST	USA, NIST, PWB		
Ion	Range	0.001 to 19900	–						0.01 - 0.99/ 1.0 - 199.9/ 200 - 1999 ppm	–	
	Resolution	2 or 3 digits	–						0.01, 0.1, 1 ppm	–	
	Accuracy	0.5 % Full scale (Monovalent) 1 % Full scale (Divalent)	–						±1 % Full scale	–	
	Calibration Points	Up to 8	–						Up to 3	–	
Temperature	Range	-10 to 110 °C/14 to 230 °F			-10 to 110 °C		-10 to 110 °C/ 14 to 230 °F	0.0 to 100.0 °C			
	Resolution	0.1 °C/0.1 °F			0.1 °C		0.1 °C/0.1 °F	0.1 °C			
	Accuracy	±0.5 °C/±0.9 °F			±0.5 °C		±0.5 °C/±0.9 °F	±0.5 °C			
mV	Range	±2000.0 mV			-199.9 to +199.9 mV, ±1999 mV				±500 mV	±1000 mV	–
	Resolution	0.1 mV			0.1 mV (±199.9) ; 1 mV (Beyond)					1 mV	–
	Accuracy	±0.2 mV			±0.2 mV (±199.9) ; ±2 mV (Beyond)					±2 mV	–
Meter Features	Temperature Compensation	ATC/MTC (0 to 100 °C)									
	Memory	500 Data sets			50 Data sets	16 Data sets	100 Data sets	50 Data sets	No		
	Auto-Off	2 to 30 Mins after last key pressed			20 Mins after last key pressed						
	Date/Time Stamp (GLP)	Yes			–						
	Average/ Stability	Yes									
	Inputs	DC Phono sockets, 8 pin connector, BNC			6 Pin connector, BNC		DC Socket, BNC, 2.5 mm phono socket		BNC, 2.5 mm Phono socket		
	Output	IrDA, RS232C			-		RS232C	-			
	Power Requirements	4x 1.5 V 'AA' Alkaline batteries or 9 V DC Adapter, 500 mA			4x 1.5 V 'AAA' Alkaline batteries		4x 1.5 V 'AAA' Alkaline batteries or 9 V DC Adapter, 200 mA		4x 1.5 V 'AAA' Alkaline batteries		
	Battery Life	> 500 Hours			> 200 Hours		> 700 Hours		> 200 Hours		
	Waterproof/ Dustproof (IP67)	Yes					No				
Dimensions (LxWxH) ; Weight	Meter	18.3 x 9.5 x 5.7 cm ; 460 g			19 x 10 x 6 cm ; 320 g		18 x 9 x 4 cm ; 220 g		14 x 17 x 3.5 cm ; 200 g		
	Boxed	23.5 x 16 x 15.5 cm ; 800 g			24 x 23 x 7 cm ; 700 g		24 x 23 x 7 cm ; 600 g		24 x 17 x 8 cm ; 550 g		

Order Code	Part No.	Description
ECPHWP62042K	01X415107	Waterproof CyberScan pH 620 pH/mV/Ion handheld meter with pH electrode, ATC probe, power adapter & pH carrying kit set
ECPHWP61042K	01X415106	Waterproof CyberScan pH 610 pH/mV handheld meter with pH electrode, ATC probe, power adapter & pH carrying kit set
ECPHWP60042K	01X415105	Waterproof CyberScan pH 600 pH/mV handheld meter with pH electrode, ATC probe, power adapter & pH carrying kit set
ECPHWP31002K	01X245301	Waterproof CyberScan pH 310 pH/mV handheld meter with pH electrode, ATC, 2 electrode holders & CyberScan pH carry kit set (ECPHWPKIT)
ECPHWP30002K	01X245201	Waterproof CyberScan pH 300 pH/mV handheld meter with pH electrode, ATC, 2 electrode holders & CyberScan pH carry kit set (ECPHWPKIT)
ECPH11002K	01X361203	CyberScan pH 110 pH/mV/RS232 handheld meter with pH electrode, ATC, 2 electrode holders, DAS software, RS232C cable & CyberScan pH carry kit set (ECPHWPKIT)
ECPH1102K	01X361103	CyberScan pH 11 pH/mV handheld meter with pH electrode, ATC, 2 electrode holders & CyberScan pH carry kit set (ECPHWPKIT)
ECION602K	01X256408	EcoScan Ion 6 Ion/pH/mV handheld meter with pH electrode, ATC & EcoScan pH carry kit set (ECECOPHKIT)
ECPH602K	01X245007	EcoScan pH 6 pH/mV handheld meter with pH electrode, ATC & EcoScan pH carry kit set (ECECOPHKIT)
ECPH502K	01X244907	EcoScan pH 5 pH handheld meter with pH electrode, ATC & EcoScan pH carry kit set (ECECOPHKIT)
Accessories		
ECECOPHKIT	01X266901	EcoScan pH carry kit set – EcoScan plastic carry case comprises 1 x pH 4.01, pH 7.00, storage solution & 1 x deionised (rinse) water
ECPHWPKIT	01X266801	CyberScan pH carry kit set – CyberScan plastic carry case comprises 1 x pH 4.01, pH 7.00, storage solution & 1 x deionised (rinse) water

Ion-selective electrode measurement has never been this easy. Harvesting the sophisticated features of CyberScan pH 6000, the CyberScan pH 6500 comes with dual-channel capability, so there is no need to recalibrate every time you switch from pH to ISE measurement. Advance internet communications capabilities allows you to send and receive information directly in any format to any computer you want.

Dual channel capability – no need for recalibration every time you switch from pH to ISE measurement
21 CFR Part 11-compliant application software available *(software sold separately)*
World's first Windows® CE-driven colour touchscreen bench meter
Stores up to 1000 data sets for each parameter
1799.6
7.00

Upload or download data easily into an SD card* or USB thumbdrive*

** Available at Eutech*

Internet/ethernet-ready connection: send data via email directly from meter!

CyberScan pH 6500

pH/mV/Ion/ºC/ºF

- Up to two channels measured and displayed simultaneously without cross channel interference
- Accepts standard BNC pH glass electrodes and DIN pH ISFET electrodes – no need for adapters
- Wide pH and mV measurement range: -2.000 to 20.000 pH and ± 2000.0 mV
- 'Direct/indirect', 'known addition/subtraction' and 'analate addition/subtraction' Ion measurement methods in ppm, %, mg/mL and mole/L
- Advanced real-time on-screen graphing function provides useful indication for specific measurements such as titration
- Extensive setup screens enable you to customise meter to your needs, e.g. isopotential point, temperature units, Ion method, ISE electrode type, alarm limits and other functions
- Advanced USB, IrDA connectivity allows extensive host/device communication capabilities
- Secure log-in for up to ten users

ATC MTC GLP AUTO-BUFFER IrDA RS232

Presenting Eutech's CyberScan 6000 series, the world's first Windows® CE-driven, full-colour touchscreen bench meter with advanced communication capabilities. Now, you can choose to send and receive information the way you want; using a USB port, wirelessly with IrDA, through a local server via LAN connection, or over the Internet to any computer in the world.

CyberScan pH 6000

pH/mV/ºC/ºF

Pull-out on-screen keypad for easy data input

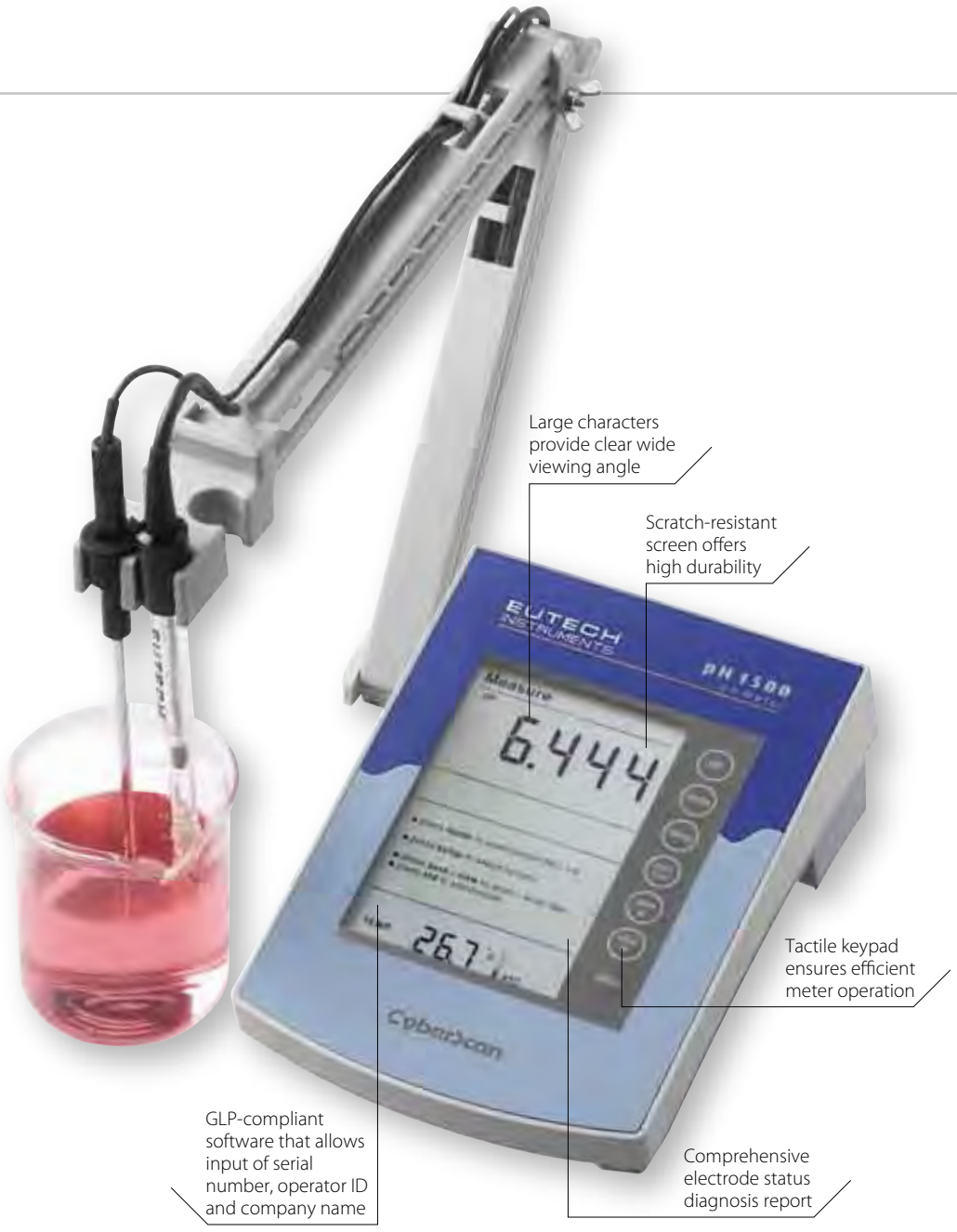
Advanced USB, IrDA connectivity allows extensive host/device communication capabilities

21 CFR Part 11-compliant application software available *(software sold separately)*
World's first Windows® CE-driven research-grade bench meter
Internet/ethernet-ready connection
Definitive full-colour display enhances user-friendliness
Stores up to 1000 data sets per parameter
Real-time on-screen graphing function for specific measurements like titration
7.00
CyberScan
EUTECH INSTRUMENTS

- Easy, single-channel operation for pH and ORP measurements without compromising on performance or features
- Auto-calibrates with up to five pH buffers from three standard set and fifteen different buffers; also accepts custom buffers and manual calibration
- Accept standard BNC pH glass electrodes and DIN pH ISFET electrodes – no need for adapters
- Advance real-time on-screen graphing function provides useful indication for specific measurements such as titration
- Extensive set-up screens enable you to customise meter to your needs
- Secure login for up to 10 users
- Plays media files

ATC MTC GLP AUTO-BUFFER IrDA RS232

Self-diagnostic and intuitive with advance set-up options for user-customisation – the Eutech CyberScan 1500 series comes with bi-directional RS232 interface for seamless data transfer and a rugged IP54-compliant splash-proof keypad.


Large characters provide clear wide viewing angle
Scratch-resistant screen offers high durability
Tactile keypad ensures efficient meter operation
GLP-compliant software that allows input of serial number, operator ID and company name
Comprehensive electrode status diagnosis report
EUTECH INSTRUMENTS
pH 1500
6.444
26.7
CyberScan

Bi-directional RS232C connector for seamless interface with computer and printer
Allows direct use of ISFET electrodes
Accepts a wide variety of BNC electrodes

One screen tells all

CyberScan pH 1500

pH/mV/ºC/ºF

- Measures pH, mV (ORP) Relative mV and Temperature in °C and °F
- User-selectable pH resolution and accuracy
- 0.001/0.01/0.1 pH resolution and ±0.002/0.01/0.1 pH accuracy
- Multi-point push-button calibration with auto-buffer recognition (up to 6 pH buffers)
- Accepts standard glass pH combination, half-cell or non-glass solid-state FET pH electrode directly without the need for adapters
- Supplied software allows input of serial number, operator ID and company name for GLP requirements

ATC MTC AUTO-BUFFER IrDA RS232 CE

Applications

Educational: *Useful for most laboratory, ecological studies and other applications.*

Laboratory: *Environmental studies, chemical labs, titrations and quality assurance testing, where GLP data-management is required. Use in all types of food processing.*

Designed for optimum performance, versatility and ease-of-use, the Eutech CyberScan pH 1100 and pH 2100 are perfect for advanced GLP-compliant laboratory research.

CyberScan pH 1100; CyberScan pH 2100

pH/mV/ºC/ºF ; pH/mV/Ion/ºC/ºF

Back-lit display facilitates reading in the dark

Data log/print and bi-directional RS232 communication

Data is time and date indexed for GLP compliance
Numbered keypad for quick data entry
Quick reference slide-out instruction card

- Up to 0.001 pH resolution, ±0.002 pH accuracy
- Back-lit dual-line display
- High/low set point alarms alert when readings fall outside preset limits
- Up to 5 pH calibration buffer sets with auto-buffer recognition
- Displays last calibration date and time
- Cal-due alarm and memory stamp with time and date for ISO and GLP compliance
- Easy electrode diagnosis with pH slope and offset display
- Non-volatile memory stores up to 100 data sets
- Auto-data logging via time interval or reading stability
- ORP measurement capability
- RS232C communication interface for easy data-transfer

Expanded Feature of CyberScan pH 2100

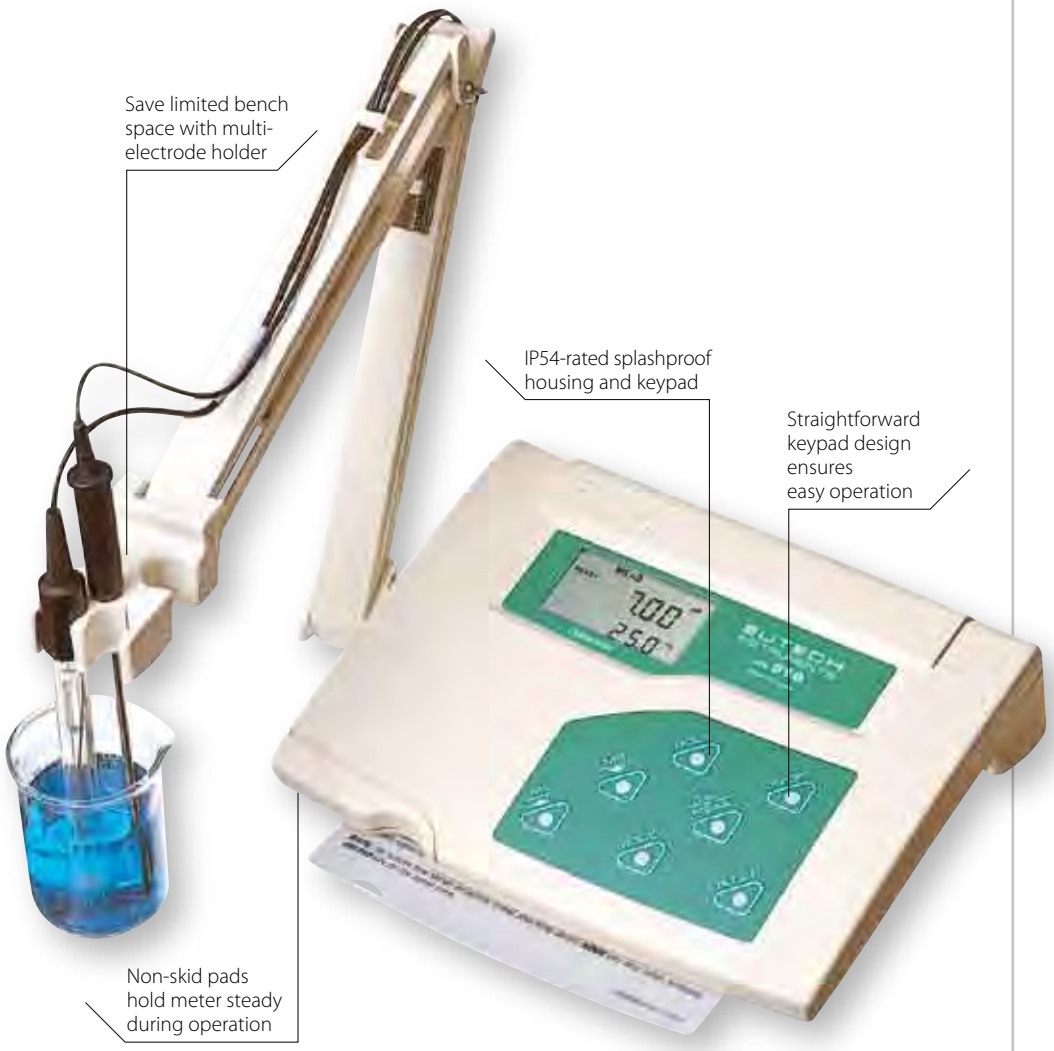
- Direct Ion concentration measurement capability with ISE electrodes

Applications

Educational: *Useful for most laboratory, ecological studies and other applications.*

Laboratory: *Environmental studies, chemical labs, titrations and quality assurance testing, where GLP data-management is required. Use in all types of food processing.*

The CyberScan 510 series offers high performance at an economical cost. Integrating signature Eutech user-friendly interface such as splash-proof keypad and custom dual-display LCD, this economy range of bench meters is ideal for routine use in laboratories, production plants and student experiments in school.


Save limited bench space with multi-electrode holder
IP54-rated splashproof housing and keypad
Straightforward keypad design ensures easy operation
Non-skid pads hold meter steady during operation

Dual-display LCD

Quick reference slide-out instruction card

CyberScan pH 510; CyberScan Ion 510

pH/mV/ºC ; Ion/pH/mV/ºC

- Up to 5 pH point push button calibration with auto-buffer recognition
- Analog recorder output for easy documentation
- Selectable automatic/manual temperature compensation
- Easy electrode diagnosis with pH slope and offset display
- Non-volatile memory stores up to 100 data sets
- Integral electrode holder
- Hold function freezes readings for easy reference
- Meter prompts when reading stabilizes
- Easy trouble-shooting with comprehensive self-diagnostic messages

Expanded Feature of CyberScan Ion 510

- Ion concentration measurement from 0.01 to 1999 ppm

ATC MTC AUTO-BUFFER

Applications

Educational: *Useful for most laboratory, ecological studies and other applications.*

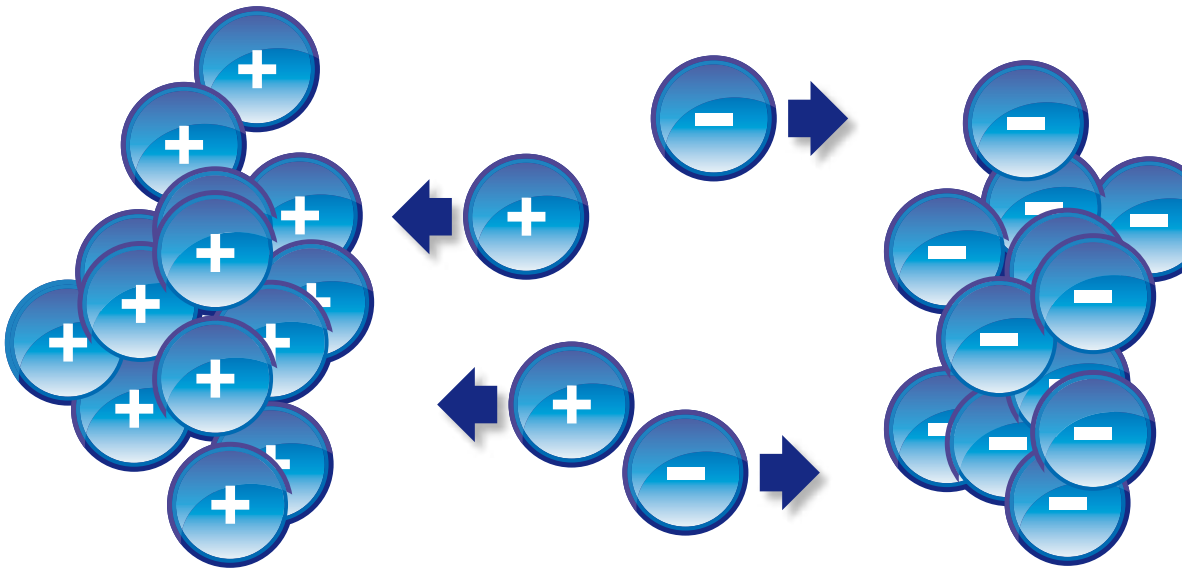
Laboratory: *Environmental studies, chemical labs, titrations and quality assurance testing. Use in all types of food processing.*

pH/ORP Bench Meters Specifications		CyberScan Premium Bench			CyberScan Deluxe Bench		CyberScan Economy Bench	
		pH 6500	pH 6000	pH 1500	pH 2100	pH 1100	Ion 510	pH 510
Measuring Parameter		pH/mV/Ion/ºC/ºF	pH/mV/ºC/ºF		pH/mV/Ion/ºC/ºF	pH/mV/ºC/ºF	Ion/pH/mV/ºC	pH/mV/ºC
Highlights		Windows® CE dual channel colour touchscreen, (with pH FET)	Windows® CE single channel colour touchscreen, (with pH FET)	Extensive display, (with pH FET)	Back-lit dual-display with Ion concentration measurement	Back-lit dual-display	Dual-display with Ion concentration measurement	Dual-display standard bench
pH	Range	-2.000 to +20.000 pH		-1.999 to +19.999 pH	-1.000 to 14.000 pH		0.00 to 14.00 pH	
	Resolution	0.1/0.01/0.001 pH			0.01/0.001 pH		0.01 pH	
	Accuracy	±0.1/0.01/0.002 pH			±0.01/0.002 pH		±0.01 pH	
	Calibration Points	Up to 5		Up to 6	Up to 5			
	Buffer Sets	USA, NIST, Euro, Custom			USA, NIST, Custom		USA, NIST	
Ion	Concentration	1 x 10^{-7} to 9.99 x 10^{10} ppm	–	–	0.001 to 19999 ppm	–	0.01 to 1999 ppm	–
	Resolution	2/3 or 4 Digits	–	–	0.001, 0.01, 0.1, 1 ppm	–	0.01, 0.1, 1 ppm	–
	Accuracy	±0.17 % Full scale (monovalent) ±0.34 % Full scale (divalent)	–	–	±0.5 % Full scale (monovalent) ±1 % Full scale (divalent)	–	±0.5 % Full scale (monovalent) ±1 % Full scale (divalent)	–
	Calibration Points	Up to 5	–	–	Up to 5	–	Up to 3	–
Temperature	Range	-5.0 to 105.0 ºC/23.0 to 221.0 ºF					0.0 to 100.0 ºC	
	Resolution	0.1 ºC/0.1 ºF						
	Accuracy	±0.2 ºC/±0.3 ºF		±0.3 ºC/0.5 ºF				
mV	Range	±2000.0 mV		±1850.0 mV			±1999 mV	
	Resolution	0.1 mV					0.1 mV (±199.9 mV)/1 mV (Beyond)	
	Accuracy	±0.2 mV					±0.2 mV (±199.9 mV)/2 mV (Beyond)	
Meter Features	Temperature Compensation	ATC/MTC (0 to 100 ºC)						
	Memory	Up to 1000 data sets per parameter		100 Data sets			100 Data sets	
	Date/Time Stamp (GLP)	Yes		No	Yes		No	
	Input	DC Socket, DIN connector, BNC SD reader, USB, RJ45, phono		DC Socket, BNC phono, DIN connector	DC Socket, BNC, phono		DC Socket, BNC, phono	
	Output	USB, IrDA, RS232C		RS232C	Recorder, RS232C		Recorder	
	Power Requirements	9 V DC Adapter, 3.3 A (100/240 VAC, SMPS)		12 V DC Adapter, 300 mA (100/240 VAC, SMPS)	9 V DC Adapter, 300 mA (100/240 VAC, SMPS)		9 V DC Adapter, 500 mA (110/220 VAC, linear)	
Dimensions (LxWxH) ; Weight	Meter	16.5 x 23.5 x 8.9 cm ; 1100 g		18 x 23 x 6 cm ; 950 g	23 x 18 x 6.3 cm ; 850 g		23 x 18 x 6 cm ; 750 g	
	Boxed	49 x 28 x 16 cm ; 3700 g		40 x 26 x 9 cm ; 1600 g	40 x 26 x 9 cm ; 1400 g			

Order Code	Part No.	Description
ECPH650042S	01X373705	CyberScan pH 6500 pH/pH FET/Ion/mV bench meter with USB, RJ 45, IrDA, SD card reader, RS232C, pH electrode, ATC probe, integral electrode holder, pH buffer sachets & SMPS power adapter
ECPH600042S	01X373505	CyberScan pH 6000 pH/pH FET/mV bench meter with USB, RJ 45, IrDA, SD card reader, RS232C, pH electrode, ATC probe, integral electrode holder, pH buffer sachets & SMPS power adapter
ECPH150042S	01X296209	CyberScan pH 1500 pH/mV/RS232 bench meter with DAS, RS232C cable, pH electrode, ATC probe, integral electrode holder & SMPS power adapter
ECPH210042S	01X279003	CyberScan pH 2100 Ion/pH/mV RS232 bench meter with DAS, RS232C cable, pH electrode, ATC probe, integral electrode holder & SMPS power adapter
ECPH110042S	01X279006	CyberScan pH 1100 bench pH/mV RS232 bench meter with DAS, RS232C cable, pH electrode, ATC probe, integral electrode holder & SMPS power adapter
ECION51041S	01X263911	CyberScan Ion 510 bench Ion/pH/mV bench meter with ATC probe, integral electrode holder & SMPS power adapter
ECPH51042S	01X263318	CyberScan pH 510 bench pH/mV bench meter with pH electrode, ATC probe, integral electrode holder & SMPS power adapter

Conductivity/Total Dissolved Solids : :

A measure of the impurities in water supplies for domestic and industrial use.



About Conductivity Measurement

Introduction to Conductivity, TDS and Salinity

Electrical Conductivity (EC) meters measure the capacity of ions in an aqueous solution to carry electrical current. As the ranges in aqueous solutions are usually small, the basic units of measurements are milliSiemens/cm (mS/cm) and microSiemens/cm (µS/cm).

Solution	Conductivity
Absolute pure water	0.055 µS/cm
Power plant boiler water	1.0 µS/cm
Good city water	50 µS/cm
Ocean water	53 mS/cm
Distilled water	0.5 µS/cm
Deionised water	0.1 - 10 µS/cm
Demineralised water	0 - 80 µS/cm
Drinking water	0.5 - 1 mS/cm
Wastewater	0.9 - 9 mS/cm
Seawater	53 mS/cm
10 % NaOH	355 mS/cm
10 % H_2SO_4	432 mS/cm
31 % HNO_3	865 mS/cm

Conductivity is used widely to determine the level of impurities in water supplies for domestic consumption as well as industrial use. Industries that employ this method include the chemical, semi-conductor, power generation, hospitals, textile, iron and steel, food and beverage, mining, electroplating, pulp and paper, petroleum and marine industries.

Specific applications include chemical streams, demineraliser output, reverse osmosis, stream boilers, condensate return, waste streams, boiler blowdown, cooling towers, desalinisation, laboratory analysis, fruit peeling and salinity level detection in oceanography.

Eutech offers a wide range of conductivity meters for these various applications. Models include the ECTestr™ series, EcoScan CON 6, CyberScan handheld CON 11 and CON 110, CyberScan waterproof CON 400 and CON 410 and CyberScan bench meters CON 510, CON 1500, CON 6000 as well as the handheld multi-parameters PC 10, PC 300, PC 510 and colour touchscreen research-grade bench series PC 6000, PC 6500 and PCD 6500.

The total TDS is a mass estimate and is dependent on the mix of chemical species as well as the concentration while conductivity is only dependent on the concentration of chemical species. Some applications require the measurement of Total Dissolved Solids (TDS) in mg/L, parts per million (ppm) or parts per thousand (ppt). The TDS concentration can be obtained by multiplying the conductivity value with a factor which is empirically determined.

Eutech offers meters that allow the direct reading of TDS values. These include the TDSTestr™ series, EcoScan TDS 6, CyberScan standard handheld CON 11, CON 110 and waterproof handheld CON 410. Bench meters for advanced level laboratory research are the CyberScan CON 510, CON 1500 and colour touchscreen research-grade CON 6000.

Salinity measurements are common in industries like agriculture, aquaculture, hydroponics, food, pools and spas where it is necessary to monitor the salt level constantly. The values are usually read in parts per thousand (ppt) or % (1 ppt = 1 gram per litre).

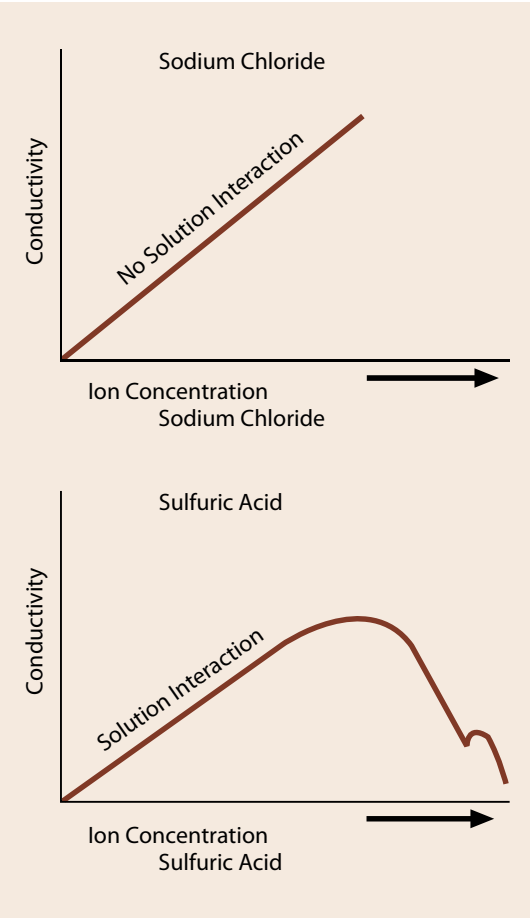
The Eutech salinity pocket testers SaltTestr™ series are specially developed to provide direct readings in these applications.

The Principle of Conductivity Measurement

The principle by which instruments measure conductivity is simple – two plates are placed in the sample, a potential is applied across the plates (normally a sine wave voltage), and the current is measured. Conductivity (G), the inverse of Resistivity (R) is determined from the voltage and current values according to Ohm's law.

$$G = I/R = I \text{ (amps)} / E \text{ (volts)}$$

Since the charge on ions in solution facilitates the conductance of electrical current, the conductivity of a solution is proportional to its ion concentration. In some situations, however, conductivity may not correlate directly to concentration. The graphs below illustrate the relationship between conductivity and ion concentration for two common solutions. Notice that the graph is linear for sodium chloride solution, but not for highly concentrated sulfuric acid. Ionic interactions can alter the linear relationship between conductivity and concentration in some highly concentrated solutions.



Units of Measurement

The basic unit of conductivity is the Siemens (S), formerly called the mho. Since cell geometry affects conductivity values, standardized measurements are expressed in specific conductivity units (S/cm) to compensate for variations in electrode dimensions. Specific conductivity (C) is simply the product of measured conductivity (G) and the electrode cell constant (L/A), where L is the length of the column of liquid between the electrode and A is the area of the electrodes.

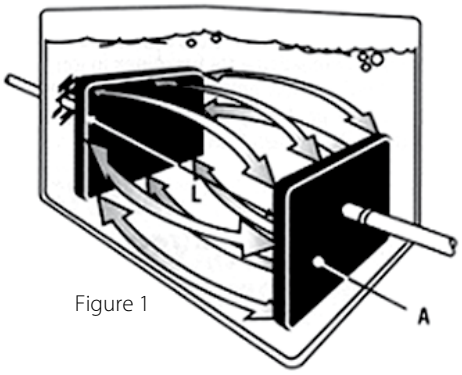


Figure 1

$$C = G \times (L/A)$$

If the cell constant is 1 cm^{-1}, the specific conductivity is the same as the measured conductivity of the solution. Although electrode shapes vary, an electrode can always be represented by an equivalent theoretical cell.

Conductivity Temperature Compensation

Conductivity measurements are temperature dependent. The degree to which temperature affects conductivity varies from solution to solution and can be calculated using the following formula:

$$Gt = Gt_{std} \{1 + \alpha(T-T_{std})\}$$

where:

Gt = Conductivity at measured Temperature T in °C;
Gt_{std} = Conductivity at Reference (Normalisation) Temperature T_{std} in °C;
α = Temperature Coefficient of solution at T_{std} in °C;
T_{std} = Reference or Normalisation Temperature in °C

All meters have either fixed or adjustable automatic temperature compensation referenced to a standard temperature – usually 25 °C. Most meters with fixed temperature compensation use α of 2 % per °C (the approximate α of NaCl solutions at 25 °C). Meters with adjustable temperature compensation let you to adjust the α to more closely match the α of your measured solution.

Conductivity Meter Calibration and Cell Maintenance

Conductivity meters and cells should be calibrated to a standard solution before using. When selecting a standard, choose one that has the approximate conductivity of the solution to be measured.

A polarized or fouled electrode must be cleaned to renew the active surface of the cell. In most situations, hot water with a mild liquid detergent is an effective cleanser. Acetone easily cleans most organic matter, and chlorine solutions will remove algae, bacteria or molds. To prevent cell damage, abrasives or sharp objects should not be used to clean an electrode. A cotton bud works well for cleaning but care must be taken not to widen the distance of cell.

Conductivity Cells

Most conductivity meters have a 2-cell electrode available in either dip or flow-through styles. The electrode surface is usually platinum, titanium, gold-plated nickel, or graphite. The 4-cell electrode uses a reference voltage to compensate for any polarization or fouling of the electrode plates. The reference voltage ensures that measurements indicate actual conductivity independent of electrode condition, resulting in higher accuracy for measuring pure water.

The Eutech EC620165 4-cell conductivity electrode (cell constant K=1.0) with in-built ATC and DIN connector is available for use with the bench meters CON 1500, PC 6000, PC 6500 and PCD 6500. ECCONSEN9203J 4-cell conductivity electrode with ATC and 3 m cable is available for COND 600, COND 610, PCD 650 and CD 650 handheld meters.

Important Features to Consider in a Conductivity Meter

- **Auto-Ranging**
  Meter automatically selects the appropriate range for measurement. There is no need to change the dial, multiply values on the display, or turn the potentiometer.

- **Temperature Compensation**
  A cell with built-in temperature sensor allows the meter to make adjustments to the conductivity or TDS readings based on changes in solution temperature.

- **TDS Conversion Factor**
  When a solution does not have a similar ionic content to natural water or salt water, then a TDS conversion factor is needed to automatically adjust the readings.

- **Adjustable Temperature Coefficients**
  The TDS of certain samples, such as alcohols and pure water, are affected by changes in temperature. An adjustable temperature coefficient allows the user to compensate for temperature changes on the solution being measured.

- **Adjustable Cell Constant**
  Adjusts the reading on the display to reflect use of a cell with a constant other than k=1.0 cm^{-1}.

Eutech's wide range of conductivity meters incorporates these features for consistent, accurate and reliable measurements.

<< Photo Development
>> Industrial Boilers

Offering one of the best accuracies in pocket-sized TDS and conductivity meters today, the ECTestr® 11 series and TDSTestr® 11 series come with ±1 % full scale accuracy over a broad measurement range. Handy, IP67-waterproof and long-lasting, the testers are so light, they float!

ECTestr® 11; ECTestr® 11+ ; TDSTestr® 11; TDSTestr® 11+

Conductivity/°C/°F ; Conductivity/°C/°F ; TDS/°C/°F ; TDS/°C/°F

Unique cup-style design of '+' series allows you to hold small volumes of sample

Simultaneous temperature display
VALOX® sensor casing for superior chemical durability
Sensor element made from industrial grade SS316 stainless steel type to protect against harsh samples
Dip-type sensor for the non-'+' models

High Accuracy

- TDSTestr 11+ series measures up to 20.00 ppt
- ECTestr 11+ series measures up to 20.00 mS/cm
- Selectable TDS factor (0.40 to 1.00) for TDSTestr 11 series
- Selectable single/multi-point calibration with auto/manual options
- ±1 % full scale accuracy

Long Lasting

- Unique cup-style* sensor with Valox® casing. Industrial grade SS316 stainless steel sensor element protects against harsh sample and ensures superior chemical durability
- Reduced operating cost – use tester body again and again with user-replaceable sensor
- Rugged and waterproof to IP67 standards. So light, it floats!

** For ECTestr 11+ & TDSTestr 11+*

User-Friendly

- Auto-ranging capabilities options with convenient direct readout and optional range selection
- Temperature display with °C and °F options – no need for separate thermometer!
- Non-volatile memory retains tester settings, even when batteries run out

ATC AUTO-CAL

Applications

• Water & wastewater treatment • Boiler blow-down • Electroplating rinse tanks • Drinking water • Hydroponics • Printing Industry • Aquaculture • Aquariums & fish farms • Swimming pools • Others

Conductivity/ TDS Pocket Testers Specifications		**EC Waterproof Large Dual-Display Pocket Tester**		**TDS Waterproof Large Dual-Display Pocket Tester**	
		ECTestr 11+	**ECTestr 11**	**TDSTestr 11+**	**TDSTestr 11**
Measuring Parameter		Conductivity/°C/°F		TDS/°C/°F	
Highlights		Multi-range	Dual-range	Multi-range	Dual-range
Conductivity	Range	.. to 200.0 µS/cm .. to 2000 µS/cm .. to 20.00 mS/cm	.. to 2000 µS/cm .. to 20.00 mS/cm	.. to 200.0 ppm .. to 2000 ppm .. to 10.00 ppt	.. to 2000 ppm .. to 10.00 ppt
	Resolution	0.1 µS/cm 1 µS/cm 0.01 mS/cm	10 µS/cm 0.10 mS/cm	0.1 ppm 1 ppm 0.01 ppt	10 ppm 0.10 ppt
	Accuracy	±1 % Full scale			
TDS Factor		–		0.40 to 1.00 (Selectable)	
Calibration Points		3 Auto, 3 Manual	2 Auto, 2 Manual	3 Manual	2 Manual
Temperature	Range	0 to 50.0 °C or 32.0 to 122.0 °F			
	Resolution	0.1 °C/°F			
	Accuracy	±0.5 °C/0.9 °F			
	Calibration Window	±5.0 °C/9.0 °F			
Meter Features	ATC	Yes (0 to 50 °C or 32.0 to 122.0 °F)		Yes (0.0 to 50.0 °C or 32.0 to 122.0 °F)	
	Sensor Type	Cup	Dip	Cup	Dip
	Temperature Coefficient	2 % per °C			
	Normalization Temperature	25.0 °C			
	Non-Volatile Memory	Yes			
	Auto-Off	8.5 Mins after last key pressed			
	Operating Temperature	0.0 to 50.0 °C			
	LCD Display	Custom dual-display 2.7 cm (H) x 2.1 cm (W)			
	Power	4x 1.5 V 'A76' Micro alkaline batteries			
	Battery Life	> 150 Hours			
Dimensions (LxWxH) ; Weight	Tester	16.5 x 3.8 cm ; 90 g			
	Boxed	22 x 6 x 5 cm ; 170 g			

• 1 mS/cm = 1000 µS/cm (µS: microSiemens / mS: miliSiemens) • 1 ppt = 1000 ppm (ppm: parts per million / ppt: parts per thousand)

Order Code	**Part No.**	**Description**
ECTEST11PLS	01X377227	Waterproof ECTestr 11+ multi-range with ATC & temperature display
ECTEST11	01X377226	Waterproof ECTestr 11 dual-range with ATC & temperature display
TDSTEST11PLS	01X377234	Waterproof TDSTestr 11+ multi-range with ATC & temperature display
TDSTEST11	01X377233	Waterproof TDSTestr 11 dual-range with ATC & temperature display
Accessories		
ECTDSSENSORPLUS	01X229714	Replaceable sensor for waterproof, cup type ECTestr 11+; TDSTestr 11+
ECTDSSENSOR	01X229713	Replaceable sensor for waterproof, 2-pin type ECTestr 11; TDSTestr 11; SaltTestr 11

<< Fish Farm

>> Hydroponics

View readings, calibration and electrode status data all in one screen view – the CyberScan COND 600 comes with advanced wireless communications technology for seamless data transfer from meter to PC. Meter also accepts and auto-detects 2-cell and 4-cell conductivity probes for pure water to wastewater applications.

Wireless data transfer

Waterproof external power input

Data acquisition software included

Velcro strap for firmer grip

CyberScan COND 600; CyberScan COND 610

Conductivity/TDS/ºC/ºF ; Conductivity/TDS/Resistivity/Salinity/ºC/ºF

Wider Measuring Range
- Up to 5 Conductivity ranges in one meter with auto-ranging capabilities for more convenience
- ±1 % full scale accuracy at 3-decimal resolution
- Measures pure water with pure water temperature coefficient option

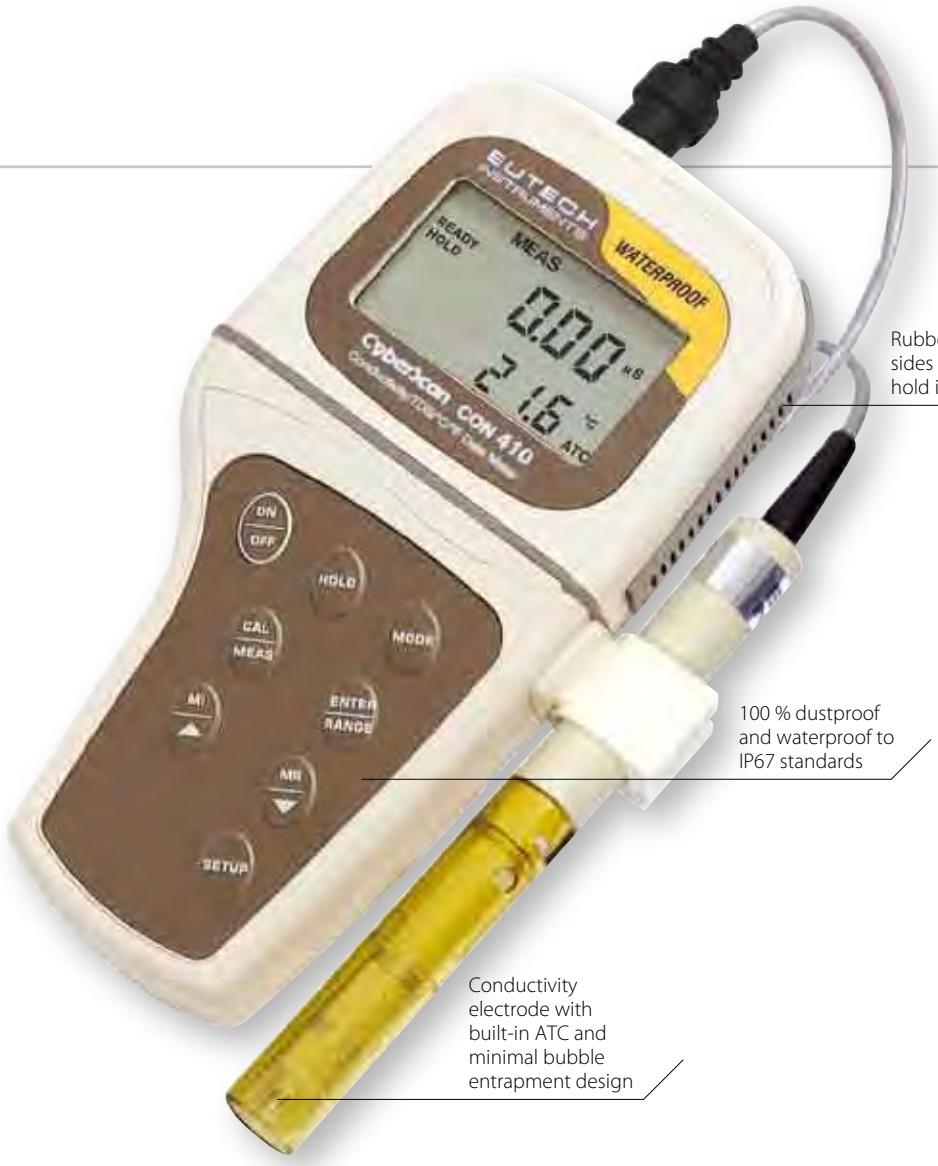
User-Friendly
- Backlit LCD screen with multi-data display – convenient for working in dark areas
- Cal-due alarm for periodic calibration updates

Advanced Data Management
- Meter logs reading automatically within seconds of measurement
- Password protection security for calibration and set-up menus
- GLP-compliant with time and date-stamping
- RS232 through LED*, IrDA wireless communications technology

** RS232 (LED) interface adapter available as separate accessory (order code: 01X344201)*

ATC MTC GLP AUTO-CAL IrDA RS232

Waterproof to IP67, the CyberScan CON 400 and 410 deliver lab-accurate results stamped with time and date for GLP-compliant research.



Rubber grips at sides enable firm hold in the field

100 % dustproof and waterproof to IP67 standards

Conductivity electrode with built-in ATC and minimal bubble entrapment design

Ergonomic slim design for that perfect palm fit

Available as a complete kit version

CyberScan CON 400; CyberScan CON 410

Conductivity/ºC/ºF ; Conductivity/TDS/ºC/ºF

- Auto-ranging with up to 5-point push-button calibration
- Selectable cell constant
- GLP-compliant
- Selectable automatic/manual temperature compensation
- Hold function freezes readings for easy reference
- Auto-off conserves energy and lengthens battery life-span
- Non-volatile memory holds up to 50 data sets even when you run out of batteries

Expanded Features of CyberScan CON 410

- Measures TDS in addition to Conductivity and temperature in °C and °F
- Adjustable TDS factor for direct derivation of TDS values

ATC MTC GLP

The economy CyberScan CON 11 and 110 are cost-effective, easy to use and self-diagnostic for easy trouble-shooting. Meters are uniquely designed to fit your palm perfectly for effortless one-hand operation.

CyberScan CON 11; CyberScan CON 110

Conductivity/TDS/ºC ; Conductivity/TDS/ºC/ºF

Direct data printout via RS232

Adjustable electrode holder

Dual-display with temperature annunciator
Ergonomically designed for easy one-hand operation
Splashproof keypad
Conductivity electrode with built-in ATC and designed for minimal bubble entrapment
IP54-rated housing protects meter against dust and water splashes
EUTECH INSTRUMENTS
CyberScan CON 110

Applications

General: *Monitor dissolved solids or Conductivity levels quickly and easily in laboratories, field, schools and educational environments.*

Industrial: *Use for testing pollution control, water treatment, and water hardness. Also useful for checking cooling towers, boiler water, fountain solutions in printing operations, brines, swimming pools, whirlpools and rinse water.*

Agricultural: *Use for checking aquariums, fish farms, hydroponics, and fertilizer/ chemical concentrations.*

- Selectable automatic and manual (single/multiple calibration) calibration options
- Full-range accuracy with up to 5-point push-button calibration
- More accurate measurements with user-customisation such as normalisation temperature, TDS factor and temperature coefficient
- Non-volatile memory holds up to 50 data sets even when you run out of batteries
- Hold function freezes readings for easy reference
- Auto-off conserves energy and lengthens battery life-span

Expanded Features of CyberScan CON 110

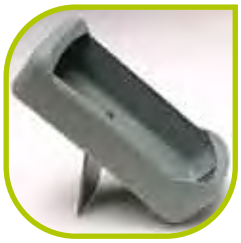
- Convenient data transfer to a printer or PC with RS232C output
- One-glance monitoring of electrode performance with electrode data display
- Non-volatile memory holds up to 100 data sets, even when you run out of batteries

Sturdy and economical – the Eutech EcoScan CON 6, TDS 6 are no-frills handhelds perfect for basic water testing needs. The meters are rugged, sturdy and come with protective rubber boots and hinges that conveniently double up as benchtop stands.

IP54-rated housing protects against dust and water splashes
Conductivity electrode with built-in ATC and designed for minimal bubble entrapment

EcoScan easy view

Splashproof keypad


Protective rubber boot doubles up as meter stand

EcoScan CON 6; EcoScan TDS 6

Conductivity/°C ; TDS/°C

- Up to 5-point push-button calibration with auto-buffer recognition – quick, easy calibration with no mistakes
- ±1 % full scale accuracy
- Selectable automatic/manual temperature compensation
- Auto-ranging for Conductivity measurements
- Adjustable TDS factor for direct derivation of values
- Non-volatile memory holds meter settings, even when batteries run out
- Easy troubleshooting with comprehensive self-diagnostic messages

ATC MTC AUTO-CAL

Applications

Routine Testing: *For quick, accurate Conductivity or TDS checks in laboratories, field and schools.*

Environmental/Agricultural: *Useful in nutrient and fertilizer checks in hydroponics and agricultural industries.*

Water Quality Testing: *For analysing water, hard water, untreated water, industrial and rinse water, drinking water, effluent water, pool water and incoming process water. Ideal for all types of quality assurance, printing industries and water quality testing.*

Conductivity/ TDS Handheld Meters Specifications		CyberScan Dual-Display						EcoScan Single-Display	
		COND 610	**COND 600**	**CON 410**	**CON 400**	**CON 110**	**CON 11**	**CON 6**	**TDS 6**
Measuring Parameter		Conductivity/ TDS/Resistivity/ Salinity/°C/°F	Conductivity/TDS/°C/°F		Conductivity/ °C/°F	Conductivity/ TDS/°C/°F	Conductivity/ TDS/°C	Conductivity/°C	TDS/°C
Highlights		Waterproof, GLP, RS232C, IrDA, linear & pure TC	Waterproof, GLP, RS232C, IrDA, linear TC	Waterproof, GLP		Expanded memory, RS232 output	Standard handheld	Economical CON measurement	Economical TDS measurement
Conductivity	Range	.. to 500.0 mS/cm	.. to 200.0 mS/cm	.. to 19.99 µS/cm, 19.9 to 199.9 µS/cm, 199 to 1999 µS/cm, 2.00 to 19.99 mS/cm, 20.0 to 199.9 mS/cm					–
	Resolution	0.05 % Full scale							
	Accuracy	±1 % Full scale + 1 LSD							
TDS	Range	.. to 500.0 ppt	.. to 200.0 ppt	.. to 10.00 ppm, 10.0 to 100.0 ppm, 100 to 1000 ppm, 1.00 to 10.00 ppt, 10.0 to 100.00 ppt	–	0 to 9.99 ppm, 10.0 to 99.9 ppm, 100 to 999 ppm, 1.00 to 9.99 ppt, 10.0 to 99.9 ppt		–	0 to 9.99 ppm, 10.0 to 99.9 ppm, 100 to 999 ppm, 1.00 to 9.99 ppt, 10.0 to 99.9 ppt
	Resolution	0.05 % Full scale			–	0.05 % Full scale			
	Accuracy	±1 % Full scale + 1 LSD			–	±1 % Full scale + 1 LSD			
	TDS Factor	0.40 to 1.00		0.40 to 1.0	–	0.40 to 1.0		–	0.40 to 1.0
Calibration Points		4 (1 per range) Auto, 5 (1 per range) Manual		5 (1 per range) Manual		4 (1 per range) Auto, 5 (1 per range) Manual			5 (1 per range) Manual
Temperature	Range	0.0 to 80.0 °C/32 to 176 °F							
	Resolution	0.1 °C/0.1 °F							
	Accuracy	±0.5 °C/±0.9 °F		±0.3 °C/±0.5 °F		±0.5 °C/±0.9 °F			
	Compensation	ATC/MTC (0 to 100 °C)		ATC/MTC (0 to 80 °C)					
	Coefficient	Linear & pure	Linear	0.0 to 10.0 %				0.0 to 3.0 %	
	Normalization	15 to 30 °C				20.0 or 25.0 °C			
	Operating Range	0 to 50 °C							
Meter Features	Cell Constant	0.010 to 10.000	0.100 to 10.000	0.1, 1.0, 10.0					
	Memory	500 Data sets		50 Data sets		100 Data sets	50 Data sets	–	
	Datalogging	Yes		No					
	Automatic Endpoint	Yes					No		
	Date/Time Stamp (GLP)	Yes				No			
	Auto-Off	2 to 30 Mins after last key pressed		20 Mins after last key pressed					
	Input	DC Phono sockets, 8 Pin connector		6 Pin connector		DC Socket, 6 pin connector		BNC, 2.5 mm Phono socket	
	Output	RS232C, IrDA		No		RS232C	No		
	Power Requirements	4x 1.5 V 'AA' Batteries or 9 V DC adapter, 500 mA		6 Pin connector		4x 1.5 V 'AAA' Batteries or 9 V DC adapter, 200 mA		4x 1.5 V 'AAA' Batteries	
	Battery Life	> 200 Hours		> 100 Hours		> 200 Hours		> 100 Hours	
	Waterproof/ Dustproof (IP67)	Yes				No		No	
Dimensions (LxWxH) ; Weight	Meter	18.3 x 9.5 x 5.7 cm ; 460 g		19 x 10 x 6 cm ; 320 g		18 x 9 x 4 cm ; 220 g		14 x 17 x 3.5 cm ; 200 g	
	Boxed	23.5 x 16 x 15.5 cm ; 800 g		24 x 23 x 7 cm ; 700 g		24 x 23 x 7 cm ; 600 g		24 x 17 x 8 cm ; 550 g	

• 1 mS/cm = 1000 µS/cm (µS: microSiemens / mS: miliSiemens) • 1 ppt = 1000 ppm (ppm: parts per million / ppt: parts per thousand)

Order Code	Part No.	Description
ECCONWP61043K	01X418307	Waterproof COND 610 handheld meter with 4-cell electrode (3 m cable), power adapter & COND/TDS carrying kit set
ECCONWP60043K	01X418304	Waterproof COND 600 handheld meter with 4-cell electrode (3 m cable), power adapter & COND/TDS carrying kit set
ECCONWP41003K	01X251412	Waterproof CON 410 Conductivity/TDS handheld meter with electrode (ECCONSEN91W), 1 electrode holder & carrying kit set (ECCONWPKIT)
ECCONWP40003K	01X251410	Waterproof CON 400 Conductivity handheld meter with electrode (ECCONSEN91W), 1 electrode holder & carrying kit set (ECCONWPKIT)
ECCON11003K	01X366309	CyberScan CON 110 Conductivity/TDS/RS232 handheld meter with DAS, RS232C cable (ECCA01M09F09), electrode (ECCONSEN91W), 1 electrode holder & carrying kit set (ECCONWPKIT)
ECCON1103K	01X366305	CyberScan CON 11 Conductivity/TDS handheld meter with electrode (ECCONSEN91W), 1 electrode holder & carrying kit set (ECCONWPKIT)
ECCON603K	01X289401	EcoScan CON 6 Conductivity handheld meter with electrode (ECCONSEN91B) & carrying kit set (ECECOCONKIT)
ECTDS603K	01X289406	EcoScan TDS 6 TDS handheld meter with electrode (ECCONSEN91B) & carrying kit set (ECECOCONKIT)
Accessories		
ECCONSEN91B	01X244701	2 stainless steel rings ultem-body electrode with ATC, cell constant K=1.0, 16 x 110 mm, BNC connector, 1 m cable (for CON 6 & TDS 6)
ECCONSEN91W	01X244702	2 stainless steel rings ultem-body electrode with ATC, cell constant K=1.0, 16 x 110 mm, 6-pin connector, 1 m cable (for CON 410/400/110/11)
ECCONSEN91J	01X244721	2 stainless steel rings ultem-body electrode with ATC, cell constant K=1.0, 16 x 110 mm, 8-pin connector & 1 m cable (for COND 610/600)
ECCONSEN9203J	01X238761	4-cell epoxy-body electrode with ATC, 8-pin connector & 3 m cable

Now, you can send your data to any computer in the world directly from your meter! Eutech's CyberScan 6000 Series is the world's first Windows CE-driven touchscreen meter series with internet/ethernet-ready connection. With its comprehensive communications capabilities, you can choose to send data in any format via the USB port, wirelessly using IrDA, or email via the internet.

CyberScan CON 6000

Conductivity/TDS/Resistivity/
Salinity/°C/°F

- Single-point and multi-point standardization for Conductivity, Resistivity, TDS and Salinity measurements using 2-cell and 4-cell probes
- Advanced real-time on-screen graphing function provides useful indication for specific measurements
- Extensive setup screens enable you to customise meter to your needs, e.g. cell constant, temperature coefficient, TDS factor, alarm limits and other functions
- Windows® CE-driven, full-color touchscreen provides unmatched ease of use in operations and setups with user-friendly icons, user prompts and context specific 'help' screens
- Advanced USB, IrDA connectivity allows extensive host/device communication capabilities
- Secure log-in for up to ten users

ATC | MTC | GLP | AUTO-BUFFER | IrDA | RS232 | CE

Distinctive with large 75 (L) x 105 (H) mm custom LCD screen, the Eutech CyberScan 1500 Series is self-diagnostic, intuitive, and features advanced set-up options for user-customisation. Meters come with bi-directional RS232 interface for seamless data transfer and a rugged IP54-compliant splash-proof keypad.

CyberScan CON 1500

Conductivity/TDS/Resistivity/ºC/ºF

Bi-directional RS232 communication to PC with DAS

GLP-compliant software that allows input of serial number, operator ID and company name
Large characters provide clear wide viewing angle
Tactile keypad ensures efficient meter operation
Detachable electrode stand organises multiple electrodes neatly and holds them firmly in place
Scratch-resistant screen offers high durability
EUTECH INSTRUMENTS
CON 1500
0.000
25.0
CyberScan

- Measures Conductivity, Resistivity and Total Dissolved Solids (TDS) with ±0.5 % accuracy
- Auto-CAL
- With preset standard Conductivity values at 84 µS/cm, 1413 µS/cm, 12.88 mS/cm, 111.8 mS/cm or manual multi-point calibration (up to 4 points) for greater flexibility
- Auto-ranging capability
- Built-in replatinising circuit
- Accepts 2-cell or 4-cell Conductivity electrodes for hassle free electrode maintenance
- Expanded memory of up to 100 data sets
- User-customization with advanced set-up mode
- Extra large easy-to-read LCD
- Other features include: ATC, self-diagnostic and stability indicator

The economy CyberScan 510 series offers high precision and stability for years of reliable, value-for-money performance. The CON 510 is an affordable meter for accurate and consistent measurement of conductivity in the laboratory, and great for student labwork in school as well.

CyberScan CON 510

Conductivity/TDS/°C/°F

Dual-display LCD

Quick reference slide-out instruction card

Save limited bench space with multi-electrode holder
IP54-rated splashproof housing and keypad
Straightforward keypad design ensures easy operation
Non-skid pads hold meter steady during operation

- High performance economy bench meter
- Selectable cell constant
- Custom dual display LCD
- Available with built-in electrode stand
- Up to 5-point push button calibration
- Auto-ranging across 5 ranges
- User-customisation
- Expanded memory of up to 50 data sets
- Other features include: Hold function, self diagnostic messages, 'ready' indicator, selectable ATC/MTC, quick reference slide out instruction card

ATC MTC AUTO-CAL

Applications

Routine Testing: *For quick, accurate Conductivity or TDS checks in laboratories, field and schools.*

Industrial: *For checking metal finishing, solutions, cooling tower water, printing fountain solutions, boiler water, brines, drilling mud, rinse tanks, ponds, pollution control, recirculating systems, waste water and industrial process systems.*

Water Quality Testing: *For analyzing hard water, untreated water, drinking water, effluent water, pool water and incoming process water. Ideal for all types of quality assurance and water quality testing.*

Conductivity/ TDS Bench Meters Specifications		CyberScan Premium Bench		CyberScan Economy Bench	
		CON 6000	CON 1500	CON 510	
Measuring Parameter		Conductivity/TDS/Resistivity/Salinity/°C/°F	Conductivity/TDS/Resistivity/°C/°F	Conductivity/TDS/°C/°F	
Highlights		Windows® CE, single channel color touchscreen	0.001 Resolution, extensive display	Economical, high performance	
Conductivity	Range	.. to 200.0 µS/cm, 200.0 µS/cm to 2.000 mS/cm, 2.000 to 20.00 mS/cm, 20.00 to 500.0 mS/cm	.. to 200.0 µS/cm, 200.0 to 2000 µS/cm, 2.000 to 20.00 mS/cm, 20.00 to 500.0 mS/cm	.. to 19.99 µS/cm, 20.0 to 199.9 µS/cm, 200 to 1999 µS/cm, 2.00 to 19.99 mS/cm, 20.0 to 199.9 mS/cm	
	Resolution	0.001, 0.01, 0.1 µS/cm, 0.001, 0.01, 0.1 mS/cm		0.01, 0.1 µS/cm, 0.01, 0.1 mS/cm	
TDS	Range	.. to 200.0 ppm, 200.0 to 2000 ppm, 2.000 to 20.00 ppt, 20.00 to 200.0 ppt, Depending on TDS factor	.. to 199.9 ppm, 200.0 to 1999 ppm, 2,000 to 19999 ppm, 20,000 to 99999 ppm	.. to 9.99 ppm, 10.0 to 99.9 ppm, 100 to 999 ppm, 1.00 to 9.99 ppt, 10.0 to 99.9 ppt	Maximum 200 ppt depending on factor setting
	Resolution	0.001, 0.01, 0.1 ppm, 0.001, 0.01, 0.1 ppt	0.001, 0.01, 0.1, 1 ppm	0.01 ppm, 0.1 ppm, 1 ppm, 0.01 ppt, 0.1 ppt	
Resistivity	Range	0 to 19.99 KOhms, 20.00 to 199.9 KOhms, 200.0 KW to 1.999 MOhms, 2.000 to 100.0 MOhms	0.000 to 19.99 KOhms, 20.00 to 199.9 KOhms, 200.0 KW to 1.999 MOhms, 2.000 to 100.0 MOhms	–	
	Resolution	0.1, 0.01, 0.001 KOhms, 0.01, 0.001 MOhms		–	
Salinity (Salt)	Range	0 to 90 ppt over 4 ranges	–	–	
	Resolution	0.1, 0.01, 0.001 ppt	–	–	
Accuracy		±0.5 % Full scale + 1 digit	±0.5 % Full scale	±1 % Full scale	
Temperature	Range	-5.0 to 105.0 °C/23.0 to 221.0 °F		0.0 to 80 °C	
	Resolution	0.1 °C/0.1 °F			
	Accuracy	±0.2 °C/±0.3 °F	±0.3 °C/±0.5 °F	±0.5 °C/±0.9 °F	
	Compensation	ATC/MTC (-5 to 100 °C)	ATC/MTC (0 to 100 °C)	ATC/MTC (0 to 80 °C)	
	Coefficient (Per °C)	0.000 to 10.000 %		0.0 to 10.0 %	
	Normalization	15.0 to 30.0 °C			
Calibration Points		4 Auto ; 4 Manual		4 Auto ; 5 Manual	
Meter Features	Cell Constant	0.1, 1.0, 10.0			
	Memory	Up to 1000 data sets per parameter	100 Data sets	50 Data sets	
	Automatic Endpoint	Yes	No	Yes	
	Input	DC Socket, DIN connector SD Reader, USB, RJ45, phono	DC Socket, DIN connector 2 Pin connector, phono	6 Pin connector	
	Output	USB, IrDA, RS232C	RS232C	No	
	Power Requirements	9 V DC Adapter, 3.3 A (100/240 VAC, SMPS)	12 V DC Adapter, 300 mA (100/240 VAC, SMPS)	9 V DC Adapter, 300 mA (100/240 VAC, SMPS)	
Dimensions (LxWxH) ; Weight	Meter	16.5 x 23.5 x 8.9 cm ; 1100 g	19.5 x 14 x 8.5 cm ; 950 g	23 x 18 x 6 cm ; 750 g	
	Boxed	49 x 28 x 16 cm ; 3700 g	40 x 26 x 9 cm ; 1600 g	40 x 26 x 9 cm ; 1400 g	

• 1 mS/cm = 1000 µS/cm (µS: microSiemens / mS: miliSiemens) • 1 ppt = 1000 ppm (ppm: parts per million / ppt: parts per thousand)

Order Code	Part No.	Description
ECCON600043S	01X373805	CyberScan CON 6000 Conductivity/TDS/Resisitivity/Salinity bench meter with USB, RJ 45, IrDA, SD card reader, RS232C meter with 4-cell electrode, integral electrode holder, Conductivity sachets & SMPS power adapter
ECCON150043S	01X296312	CyberScan CON 1500 Conductivity/TDS/RS232 bench meter with DAS, RS232C cable, Conductivity 4-cell electrode (EC620165), integral electrode holder & SMPS power adapter
ECCON51043S	01X305204	CyberScan CON 510 Conductivity/TDS bench meter with Conductivity electrode (ECCONSEN91W), integral electrode holder & SMPS power adapter
Accessories		
ECCONSEN91W	01X244702	2 stainless steel rings ultem-body electrode with ATC, cell constant K=1.0, 16x110 mm, 6-pin connector, 1 m cable (for CON 510)
EC620165	93X219046	Epoxy-body 4-cell Conductivity electrode with ATC, cell constant K=1.0, DIN connector, 1 m cable

Eutech's latest SaltTestr® 11 now comes with a new temperature display in °C and °F for easy reference during your salinity testing. Waterproof to IP67 standard, the SaltTestr® 11 assures high accuracy readings even in harsh field conditions, from aquaculture settings to food production applications.

Unlike other conventional testers, the SaltTestr® 11 offers ±1 % full scale accuracy

More User-Friendly
- Direct temperature readout in °C and °F
- Large screen display
- Battery-level indicator
- Non-volatile memory

High Accuracy
- ±1 % full scale accuracy
- Automatic Temperature Compensation (ATC)

More Savings
- Replaceable sensors
- Advanced power-conserving design

SaltTestr® 11; EcoScan Salt 6

Salinity/°C ; Salinity/°C

The EcoScan Salt 6 is an alternative tool to consider for field measurement. With sturdy rubber boot, splash-proof keypad, large custom LCD and rugged carrying case, salinity testing on the go is a breeze with this handy meter.

Protective rubber boot doubles up as stand

IP54-rated housing protects against water splashes

Splashproof keypad

- Measures in ppt. EcoScan Salt 6 also measures Salinity in %
- Temperature measurement with 0.1 °C resolution
- Quick and easy push-button calibration with ±1 % full scale accuracy
- User customisation for normalisation temperature and temperature coefficient
- Electrode with built-in ATC designed for minimal air bubble entrapment during measurement
- Rugged all-in-one meter kit available
- Other features include: HOLD function, auto-off, self-diagnostics

Reader-friendly screen display

Applications

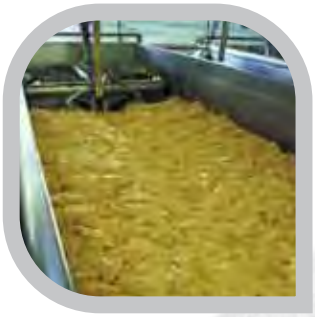
Routine Testing: *For quick, accurate Salinity measurements in laboratories, field and schools.*

Water Quality Testing: *Ideal for salt levels in brines, pool water, aquaculture systems, aquariums (marine fish) and fish ponds (koi), food processing and healthcare industries.*

Salinity Pocket Tester & Handheld Meter Specifications		EcoScan Palmtop Single-Display Salt 6	Waterproof Pocket Tester Large Dual-Display SaltTestr 11
Measuring Parameter		Salinity/°C	
Highlights		Handheld meter for high accuracy and wide range Salinity measurements	Large dual-display
Salinity (TDS)/%	Range	1.0 to 50.0 ppt/0.1 to 5.00 %	0 to 10.00 ppt
	Resolution	0.1 ppt/0.01 %	0.10 ppt
	Accuracy	±1 % Full scale	
	Calibration Point	1	
Temperature	Range	-10 to 80 °C	0 to 50 °C
	Resolution	0.1 °C	
	Accuracy	±0.5 °C	
	Compensation	ATC/MTC (0 to 50 °C)	ATC (0 to 50 °C)
	Coefficient (Per °C)	0.0 to 3.0 %	2 %
	Normalization	20.0 °C and 25.0 °C (selectable)	25.0 °C
Meter Features	Auto-Off	20 Mins after last key pressed	8.5 Mins after last key pressed
	Waterproof (IP67)	No	Yes
Power Requirements		4x 1.5 V 'AAA' Batteries	4x 1.5 V 'A76' Micro alkaline batteries
Battery Life		> 100 Hours	> 150 Hours
Dimensions (LxWxH) ; Weight	Meter	14 x 17 x 3.5 cm ; 200 g	16.5 x 3.8 cm ; 90 g
	Boxed	24 x 17 x 8 cm ; 550 g	22 x 6 x 5 cm ; 170 g

• 1 mS/cm = 1000 µS/cm (µS: microSiemens / mS: miliSiemens) • 1 ppt = 1000 ppm (ppm: parts per million / ppt: parts per thousand)

Order Code	Part No.	Description
ECSALT603K	01X289409	EcoScan Salt 6 Salinity handheld meter with electrode (ECCONSEN91B) & carrying kit set
SALTTEST11	01X377232	Waterproof SaltTestr 11 large display tester
Accessories		
ECCONSEN91B	01X244701	2 stainless steel rings ultem-body electrode with ATC, cell constant K=1.0, 12x110 mm, BNC connector, 1 m cable
ECTDSSENSOR	01X229713	Replacement sensor for waterproof SaltTestr 10 & SaltTestr, 2-pin type
ECNACL5PPT	01X211230	5 ppt Nacl calibration solution
ECNACL25PPT	01X211231	25 ppt Nacl calibration solution
ECNACL45PPT	01X211232	45 ppt Nacl calibration solution



<< Food Processing
>> Laboratories

<< Aquaculture
>> Pool Water

Dissolved Oxygen : :

The measure of the amount of gaseous oxygen dissolved in a solution.

About Dissolved Oxygen Measurement

What is Dissolved Oxygen?

Dissolved Oxygen (DO) is a measure of the amount of dissolved gaseous oxygen in a solution. Some gases, such as ammonia, carbon dioxide and hydrogen chloride, react chemically with water to form new compounds. However, gases such as nitrogen and oxygen merely dissolve in water without chemically reacting with it, and exist as microscopic bubbles between water molecules.

There are two main ways in which dissolved oxygen occurs naturally in water: From the surrounding atmosphere, where oxygen in the surrounding air dissolves readily when mixed into water, up to saturation, during water movements; Via photosynthesis when oxygen is produced by aquatic plants and algae as a by-product of photosynthesis. The amount of oxygen dissolved in water is usually measured in percent saturation, or expressed as a concentration in milligrams per litre water. Accurate measurement of dissolved oxygen is essential in processes where oxygen content affects reaction rates, process efficiency or environmental conditions, such as biological wastewater treatment, wine production, bio-reactions, environmental water testing.

Basic Principle in DO Measurement

In theory, the amount of DO in a solution is dependent on three factors, namely temperature, salinity and atmospheric pressure.

1. Water Temperature

Solubility of oxygen reduces as temperature increases. Hence, the colder the water, the more dissolved oxygen it contains. Since temperature affects both the solubility and diffusion rate of oxygen, temperature compensation is necessary for any standardized DO measurements.

All Eutech DO meters come with automatic temperature compensation for accurate readings even in varying temperature conditions.

2. Salinity

The amount of dissolved oxygen increases as salinity level decreases. In other words, freshwater holds more oxygen than saltwater. Since the presence of dissolved salts limits the amount of oxygen that can dissolve in water, the relationship between the partial pressure and concentration of oxygen varies with the salinity of the sample.

Eutech meters feature manual salinity correction to compensate for variations in ionic concentration. Simply enter the salinity of the sample in parts per thousand (ppt) to ensure the correct DO measurements.

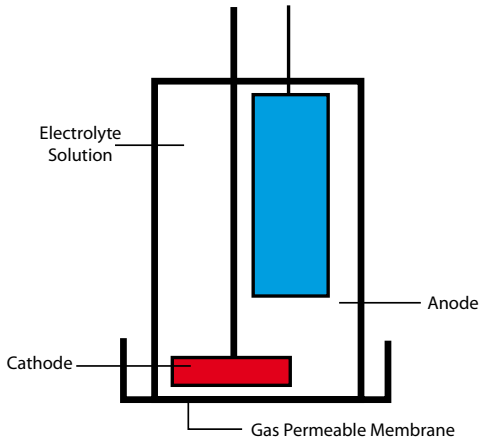
3. Atmospheric Pressure

There is a direct proportional relationship between the solubility of dissolved oxygen and the surrounding atmospheric pressure. As pressure decreases with increase in altitude, the amount of dissolved oxygen found in water reduces.

To ensure that your dissolved oxygen is not affected by atmospheric pressure, Eutech meters come with manual barometric pressure compensation, with an Atmospheric Pressure Correction Chart included in the manuals for convenient referencing.

Eutech DO instruments automatically compensate for temperature, salinity and barometric pressure. The salinity value and barometric pressure are either measured by the instrument or entered by the user.

DO Electrodes



The measurement of DO requires a special DO electrode that is made up of an anode, a cathode, electrolyte solution and a gas permeable membrane. The material of the membrane is specially selected to permit oxygen to pass through. Oxygen is consumed by the cathode which will create a partial pressure across the membrane. Oxygen then diffuses into the electrolyte solution. In short, a DO meter actually measures the pressure caused by movements of oxygen molecules in water or any other medium. Currently, galvanic and polarographic electrodes are the predominant methods for measuring dissolved oxygen.

Galvanic Electrodes produce a millivolt output directly proportional to the oxygen present in the sample. The electrode reaction is instantaneous and a result is obtained immediately.

Galvanic electrodes are available with most Eutech Instruments DO meters such as the EcoScan DO 6, CyberScan DO 110 and DO 300.

Polarographic Electrodes require voltage input from the meter to polarize the electrodes. Since the voltage from an external source may take up to 15 minutes to stabilize, polarographic probes usually need to warm up before use to ensure proper polarization of the electrodes.

Polarographic self-stirring DO/BOD probes are available for use with the Eutech CyberScan research-grade bench meters DO 6000 and PCD 6500 in US EPA-approved auto five-day BOD testings.

Biochemical Oxygen Demand (BOD)

The BOD test measures the molecular oxygen utilized in the biodegradation of organic material and the oxidation of inorganic material. By measuring the amount of oxygen dissolved in samples at the beginning and end of a specified incubation period, the relative oxygen requirements of wastewaters, effluents, and polluted waters can be determined.

$$BOD_t\ (mg/L) = \frac{D_1 - D_2}{P}$$

BOD_t = Oxygen uptake during incubation period t
D_1 = DO of diluted sample immediately after preparation (mg/L)
D_2 = DO of diluted sample after incubation period t (mg/L)
P = Decimal volumetric fraction of sample used

BOD is similar to the Chemical Oxygen Demand (COD), which also measures relative oxygen-depletion. However, the possible presence of non-biologically oxidisable may render the COD test to be less accurate.

Fast, intuitive and powerful – the CyberScan DO 600 offers one of the widest measurement ranges and biggest memory spaces offered in the DO handheld market today. Data-transfer is easy with the incorporated IrDA wireless communications technology: No wires, no cables. Send data with the press of a button!

Wireless data transfer

Waterproof external power input

Data acquisition software included

Sturdy rubber boot doubles up as meter stand

CyberScan DO 600

Dissolved Oxygen/°C/°F

Applications

Aquacultural: *Use to monitor oxygen levels in catfish and shrimp farming; game stocking ponds; ornamental fish tanks and ponds; and in other fish farming applications.*

Industrial: *Ideal for checks on the quality of plant water intake and discharge, wastewater and water treatment, recirculating systems and industrial process systems.*

Environmental: *Use to test water quality, monitor health of aquatic ecosystems, survey surface and ground water drinking supplies, and meet EPA regulations.*

Educational: *Ideal for quick, accurate DO readings in laboratories and schools.*

Wide Measurement Range
- Measures oxygen concentration up to 90.00 mg/L and saturation up to 600.0 %
- Accurate readings even in varying conditions with Temperature, Salinity and Barometric Pressure Compensation

User-Friendly
- Cal-due alarm for periodic calibration updates
- IP67 waterproof design for applications in harsh environments
- High/low alarm limits

Advanced Data-Management
- Auto-logging function that automatically records up to 500 data sets in GLP-compliant format
- RS232 through LED*, IrDA wireless communications technology

** RS232 (LED) interface adapter available as separate accessory (order code: 01X344201)*

ATC MTC GLP AUTO-CAL IrDA RS232

Designed to meet the rigours of outdoor field measurement, Eutech's waterproof CyberScan DO 300 is IP67-rated waterproof and even floats on water for easy retrieval. Its galvanic probe requires no warm-up time, delivers repeatable, stable readings and calls for almost no maintenance.

CyberScan DO 300

Dissolved Oxygen/°C/°F

Back-lit display keeps meter reader-friendly in the dark

Rubber sleeve protects connector

Meter floats

- Custom dual-display LCD that shows DO readings in ppm, mg/L or % saturation and temperature in °C and °F
- Non-volatile memory stores up to 50 data sets with temperature readings
- Auto-compensation of Salinity and Barometric Pressure with manual input
- Independent 100 % and zero adjustment calibrations
- Adjustable backlit display
- GLP-compliant, self-diagnostic for easy trouble-shooting and sturdy with IP67-compliant housing

ATC MTC GLP AUTO-CAL

Accurate with sophisticated features, yet so user-friendly – the CyberScan DO 110 delivers repeatable, stable measurements with its unique galvanic electrode – no warm-up time required!

RS232 output allows direct data transfer from meter to PC

Adjustable hinge acts as a table stand

CyberScan DO 110

Dissolved Oxygen/°C/°F

- Custom dual-display LCD that shows DO readings in mg/L (ppm) or % saturation and temperature in °C and °F
- Auto-compensation of Salinity and Barometric Pressure with manual input
- Stores up to 100 data sets with temperature readings
- Direct data transfer via RS232 output
- Independent 100 % and zero adjustment calibrations
- One-glance monitoring of electrode performance with electrode data display
- Self-diagnostic for easy trouble-shooting and sturdy with IP54 splashproof housing

ATC | MTC | AUTO-CAL | RS232 | 3 | IP54 | CE

Applications

Aquacultural: *Use to monitor oxygen levels in catfish and shrimp farming; game stocking ponds; ornamental fish tanks and ponds; and in other fish farming applications.*

Industrial: *Ideal for checks on the quality of plant water intake and discharge, wastewater and water treatment, recirculating systems and industrial process systems.*

Environmental: *Use to test water quality, monitor health of aquatic ecosystems, survey surface and ground water drinking supplies, and meet EPA regulations.*

Educational: *Ideal for quick, accurate DO readings in laboratories and schools.*

The Eutech EcoScan DO 6 offers high performance at an economical price. Rugged and user-friendly, this no-frill meter comes with a protective rubber boot that conveniently doubles up as a benchtop stand. Measures in mg/L (ppm), or % saturation.

EcoScan™ DO 6

Dissolved Oxygen/ºC

Splashproof keypad

Protective rubber boot doubles up as meter stand

EUTECH
INSTRUMENTS
8.48
EcoScan DO 6
Toggles between various modes easily with a press of the button
IP54-rated housing protects against dust and water splashes

- Push-button calibration with auto-buffer recognition for quick and easy calibrations with no mistakes
- Calibration can be performed at 100 % and/or 0 % solution
- Auto-compensation of Salinity and Barometric Pressure with manual input
- Galvanic probe eliminates polarisation delay and delivers quick, stable response
- Non-volatile memory holds meter readings, even when batteries run out
- Hold function freezes readings for easy reference
- Auto-off conserves energy and lengthens battery life-span
- Easy troubleshooting with comprehensive self-diagnostic messages

Dissolved Oxygen Handheld Meters Specifications		CyberScan Dual-Display			EcoScan Single-Display
		DO 600	DO 300	DO 110	DO 6
Measuring Parameter		Dissolved Oxygen/°C/°F			Dissolved Oxygen/°C
Highlights		Waterproof, GLP, RS232C, IrDA	Waterproof, back-lit display	Standard handheld, RS232	Economical DO meter
Dissolved Oxygen	Range	0 to 90.00 mg/L or ppm	0.00 to 19.99 mg/L or ppm		
	Resolution	0.01 mg/L or ppm	0.01 mg/L or ppm		
	Accuracy	±0.20 mg/L	±1.5 % Full scale		
% Saturation of Oxygen	Range	0 to 600.0 %	0.0 to 199.9 %		
	Resolution	0.1 %			
	Accuracy	±2.0 %	±1.5 % Full scale		
Temperature	Range	0.0 to 50.0 °C/32 to 122 °F			
	Resolution	0.1 °C/0.1 °F			0.1 °C
	Accuracy	±0.3 °C/±0.5 °F			±0.5 °C
	Compensation	ATC/MTC (0.0 to 50.0 °C)			
Salinity Correction	Range	0.0 to 50.0 ppt			
	Resolution	0.1 ppt			
	Method	Automatic correction after manual input			
Barometric Pressure Correction	Range	450 to 825 mmHg or 59.9 to 109.9 kPa	500 to 1499 mmHg or 66.6 to 199.9 kPa		
	Resolution	0.1 mmHg or 0.1 kPa			
	Method	Automatic correction with in-built sensor	Automatic correction after manual input		
Calibration		2 Point (0 %, 100 %), 1-point (mg/L)			
Operating Range		0 to 50 °C			
Probe	Type	Galvanic			
Meter Features	Auto-Off	2 to 30 Mins after last key pressed	20 Mins after last key pressed		
	Memory	500 Data sets	50 Data sets	100 Data sets	–
	Datalogging	Yes	No		
	Date/Time Stamp (GLP)	Yes		–	
	Average/ Stability	Yes (Selectable)			–
	Input	DC Phono sockets, 6 pin connector		DC Socket, 6 pin connector	BNC, 2.5 mm Phono socket
	Output	RS232C, IrDA	–	RS232C	–
	Power Requirements	4x 1.5 V 'AA' Alkaline batteries or 9 V DC adapter, 500 mA	4x 1.5 V 'AAA' Alkaline batteries	4x 1.5 V 'AAA' Alkaline batteries or 9 V DC adapter, 200 mA	4x 1.5 V 'AAA' Alkaline batteries
	Battery Life	> 400 Hours	> 700 Hours	> 700 Hours	> 100 Hours
	Waterproof/ Dustproof (IP67)	Yes		No	
Dimensions (LxWxH) ; Weight	Meter	18.3 x 9.5 x 5.7 cm ; 460 g	19 x 10 x 4.5 cm ; 320 g	18 x 9 x 4 cm ; 220 g	14 x 7 x 3.5 cm ; 200 g
	Boxed	23.5 x 16 x 15.5 cm ; 800 g	41 x 25 x 9 cm ; 1400 g	41 x 25 x 9 cm ; 1200 g	24 x 17 x 8 cm ; 550 g

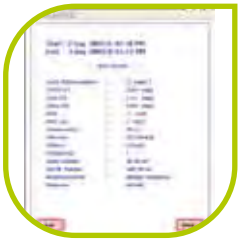
Order Code	Part No.	Description
ECDOWP60042K	01X419503	Waterproof CyberScan DO 600 Dissolved Oxygen handheld meter with 25 ft cable electrode, ECDOHANDY8M, DAS software, power adapter & carrying kit set
ECDOWP60041K	01X419502	Waterproof CyberScan DO 600 Dissolved Oxygen handheld meter with 10 ft cable electrode, ECDOHANDYNEW, DAS software, power adapter & carrying kit set
ECDOWP30001K	01X262307	Waterproof CyberScan DO 300 Dissolved Oxygen handheld meter (backlit) with 3 m cable electrode, 1 assembled membrane cap housing, refilling electrolyte & neutral carrying kit set (ECWPDRYKIT)
ECDO11001K	01X403502	CyberScan DO 110 Dissolved Oxygen handheld meter with 3 m cable electrode, DAS, RS232C cable (ECCA02M09F09), electrode, 1 assembled membrane cap housing, refilling electrolyte & neutral carrying kit set (ECWPDRYKIT)
ECDO11002K	01X403503	CyberScan DO 110 Dissolved Oxygen handheld meter with 8 m cable electrode, DAS, RS232C cable (ECCA02M09F09), electrode, 1 assembled membrane cap housing, refilling electrolyte & neutral carrying kit set (ECWPDRYKIT)
ECDO602K	01X370107	EcoScan DO 6 Dissolved Oxygen handheld meter with with 3 m cable electrode, 1 assembled membrane cap housing, refilling electrolyte & Dissolved Oxygen carrying kit set (ECECODOKIT)
ECDO601K	01X370104	EcoScan DO 6 Dissolved Oxygen handheld meter with 1 m cable electrode, 1 assembled membrane cap housing, refilling electrolyte & Dissolved Oxygen carrying kit set (ECECODOKIT)
Accessories		
ECDO6HANDY3M	01X233916	Galvanic Dissolved Oxygen electrode with ATC, 3 m cable (for DO 6)
ECDO6HANDY	01X233913	Galvanic Dissolved Oxygen electrode with ATC, 1 m cable (for DO 6)
ECDOHANDYNEW	01X239601	Galvanic Dissolved Oxygen electrode with ATC, 3 m cable (for DO 110/300/600)
ECDOHANDY8M	01X239606	Galvanic Dissolved Oxygen electrode with ATC, 8 m cable (for DO 110/300/600)
ECWPDRYKIT	01X266804	CyberScan neutral carrying kit set – plastic carrying case comprises 4 empty sample bottles (60 ml)

Versatile and user-friendly, the CyberScan DO 6000 is one of the most advanced benchtop meters for dissolved oxygen measurement available. Extensive set-up functions let you customise the meter according to your specific needs, while extensive communication capabilities give you the flexibility to send your data via any format to anywhere you want.

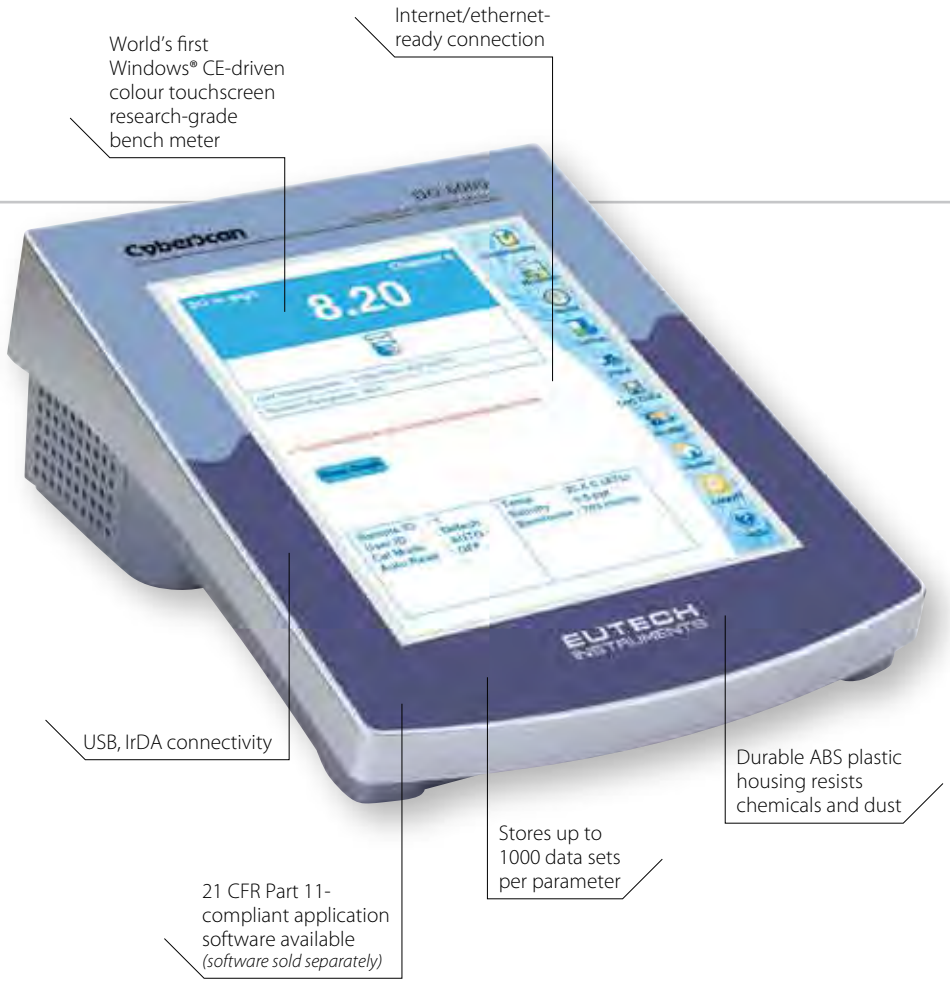
CyberScan DO 6000

Dissolved Oxygen/BOD/OUR/SOUR/ºC/ºF

Auto five-day BOD testing, OUR and SOUR with self-stirring probe that complies with EPA method requirements



Plain language prompts and automatic calculation base on BOD parameters entered


World's first Windows® CE-driven colour touchscreen research-grade bench meter
Internet/ethernet-ready connection
USB, IrDA connectivity
21 CFR Part 11-compliant application software available *(software sold separately)*
Stores up to 1000 data sets per parameter
Durable ABS plastic housing resists chemicals and dust
8.20
EUTECH INSTRUMENTS

- DO measurement includes five-day BOD testing, OUR, and SOUR
- Advanced real-time on-screen graphing function provides useful indication for specific measurements
- Extensive setup screens enable you to customise meter to your needs, e.g. Barometer and Salinity setting, BOD/OUR/SOUR configuration, alarm limits and other functions
- Windows® CE-driven, full-color touchscreen provides unmatched ease of use in operations and setups with user-friendly icons, user prompts and context specific 'help' screens
- Secure log-in for up to ten users

ATC MTC GLP IrDA RS232

Eutech's CyberScan DO 1500 is designed for optimal performance and versatility, while preserving Eutech's signature user-friendly qualities. Self-diagnostic, intuitive, with advance set-up options for user-customisation, the meter features BOD testing capabilities and comes with bi-directional RS232 interface for seamless data transfer.

CyberScan DO 1500

Dissolved Oxygen/°C/°F

- Measures Dissolved Oxygen (DO) in % saturation, ppm and mg/L
- Polarographic self-stirring DO/BOD probe (US EPA approved)
- Automatic calibration at 100 % and independent 0 % calibration enhances sensitivity for low oxygen measurement
- Auto-compensation after manual input of Barometric Pressure and Salinity values

ATC | MTC | AUTO-CAL | IrDA | RS232 | 3 Years Warranty | CE

Dissolved Oxygen Bench Meters Specifications		CyberScan Premium Bench	
		DO 6000	DO 1500
Measuring Parameter		Dissolved Oxygen/BOD/OUR/SOUR/°C/°F	Dissolved Oxygen/°C/°F
Highlights		Windows® CE, BOD, OUR and SOUR measurement, color touchscreen LCD	Self-stirring BOD probe compatible
Dissolved Oxygen	Range	0 to 60 mg/L or ppm (0 to 1272 mbar)	0 to 60 mg/L or ppm
	Resolution	0.01 mg/L or ppm (0.1 mbar)	0.01 mg/L or ppm
	Accuracy	±0.1 + 1 LSD	±0.5 % Full scale + 1 LSD
% Saturation of Oxygen	Range	0 to 600 %	
	Resolution	0.1 %	
	Accuracy	±0.1 % + 1 LSD	±0.5 % Full scale + 1 LSD
Temperature	Range	-5.0 to 46.0 °C	0.0 to 45.0 °C
	Resolution	0.1 °C	
	Accuracy	±0.1 °C	±0.3 °C
Salinity Correction	Range	0 to 45 ppt	
	Resolution	0.1 ppt	
Barometric Pressure Correction	Range	450 to 825 mmHg	
	Resolution	1 mmHg	
	Accuracy	±1 % + 1 LSD	
Meter Features	Memory	Up to 1000 data sets per parameter	100 Data sets
	Inputs	DC Socket, DIN connector, SD reader, USB, RJ45, phono socket	DIN Connector
	Output	USB, IrDA, RS232C	Bi-directional RS232C
	Power Requirements	9 V DC Adapter, 3.3 mA (100/240 VAC, SMPS)	12 V DC Adapter, 300 mA (100/240 VAC, SMPS)
Dimensions (LxWxH) ; Weight	Meter	16.5 x 23.5 x 8.9 cm ; 1100 g	19.5 x 14 x 8.5 cm ; 950 g
	Boxed	49 x 28 x 16 cm ; 3700 g	39.5 x 26 x 9 cm ; 1250 g

Order Code	Part No.	Description
ECDO600042	01X373905	CyberScan DO 6000 Dissolved Oxygen/BOD/OUR/SOUR bench meter with USB, RJ 45, IrDA, SD card reader, RS232C, self-stirring Dissolved Oxygen/BOD probe (EC620SSP) & SMPS power adapter
ECDO150042	01X296407	CyberScan DO 1500 Dissolved Oxygen bench meter with RS232C, self-stirring Dissolved Oxygen/BOD probe (EC620SSP) & SMPS adapter
Accessories		
EC620SSP	01X295704	Dissolved Oxygen/BOD electrode with self-stirring mechanism, 1 m cable

<< Shrimp Farming

>> Drinking Water

<< Wastewater Treatment

>> Laboratories

Turbidity : :

Cloudy appearance of a fluid caused by suspended microscopic particles.

About Turbidity Measurement

What is Turbidity?

Turbidity refers to the concentration of undissolved, suspended particles present in a liquid measured in Nephelometric Turbidity Units (NTU). It is important to note that turbidity is a measure of sample clarity and not colour.

Water with cloudy or opaque appearance will have high turbidity, while water that is clear or translucent will have low turbidity. High turbidity value is caused by particles such as silt, clay, microorganisms, and organic matter. By definition, turbidity is not a direct measure of these particles but rather a measure of how these particles scatter light.

Why is Turbidity Important?

This determination of clarity in water is important in many manufacturing operations such as beverage production, food processing and potable water treatment plants.

For drinking water application, a turbidity value may give an indication of presence of bacteria, pathogens, or particles that can shelter harmful organisms from disinfection process. Therefore, turbidity measurement is particularly useful for water treatment plants to ensure cleanliness.

In industrial processes, turbidity can be part of quality control to verify the efficiency in treatment or manufacturing process.

Good Measurement Techniques

Turbidity is a very complex analytical measurement which can be affected by many factors. Some are inherent in the instrument's design such as angle of detection, light beam aperture, incident beam wavelength and colour sensitivity of the photocell.

However, there are other factors such as stray light, air bubbles and care of vial, which can be prevented through proper care of equipment and accessories.

The Eutech CyberScan TB 1000 turbidimeter meets the performance criteria specified by US EPA method 180.1 for NTU measurement. In addition, the infrared light source models meet the ISO 7027 standards of measurement. The Eutech waterproof handheld TN 100 turbidimeter designed for testing on-the-go features laboratory accuracy and excellent repeatability with US EPA approved non-formazin standards and is ISO 7027 compliant.

Maintain Sample Vials in Good Condition

Sample vials must be meticulously clean and free from significant scratches. It should be treated on the outside with a thin coat of silicone oil. This is to mask minor imperfections and scratches that may contribute to stray light. Sample vials should be handled only by the top to avoid dirt accumulation (or deposits) and fingerprints that might interfere with the light path.

Match Sample Vials

Best accuracy and repeatability of turbidity measurement are achieved using a single, indexed vial. However, for more convenience, different vials can be used for measurement provided their readings with the same solution are matched. That is, the meter gives identical readings or within the specified repeatability and accuracy of the meter.

Timeliness of Sample

Samples should be measured immediately to prevent changes in particle characteristics due to temperature and settling. Temperature can affect particles by changing their behavior or creating new particles if precipitates form. Dilution water may dissolve particles or change their characteristics. It is recommended to take samples only when the turbidimeter is ready to be operated. Samples should not be drawn and allowed to sit while the instrument warms up.

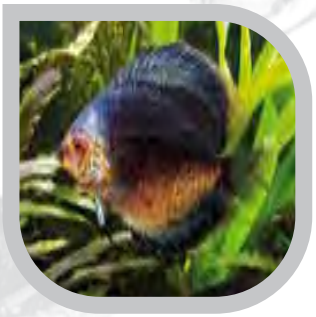
Other Important Sampling Techniques

1. Samples should not be violently shaken or agitated as particles can be broken apart or air may be entrapped into the fluid. Gentle agitation such as swirling the sample vial is advisable to reduce particle settling.
2. Sample vials should be used only with the instruments for which they are intended. Do not mix and match.
3. Perform a visual observation of the sample vial every time a measurement is made. Ensure that there are no visible bubbles in the sample and the vial is clean and free of scratches.
4. Samples placed in the turbidimeter should be at the same temperature as the process flow samples. Changes in temperature can cause precipitation of soluble compounds and affect readings.
5. Sample vials should be evaluated with a low turbidity water (after cleaning) to determine if vials remain matched. If the evaluation determines that a vial is corrupted, discard the vial. It is recommended to conduct this evaluation weekly.
6. When in doubt or question about whether a sample vial is too scratched or stained, throw it away.

The Eutech CyberScan deluxe bench meter TB 1000 allows instantaneous sampling without having to transfer samples into vials hence providing hassle-free laboratory research.

<< Beverage Production

>> Aquarium



Whether it's outfield measurements on-the-go or laboratory work with stringent requirements, turbidity measurement is a breeze with Eutech's TN 100 and Cyberscan TB 1000 turbidimeters. ISO 7027 compliant and equipped with automatic multi-point push button calibrations, Eutech's auto-ranging turbidity instruments are your assurance to high-quality full-range accuracy every time you measure.

CyberScan TB 1000; TN 100

Turbidity ; Turbidity

Data transfer through RS232C communication
Quick reference slide-out guide
Pour-through assembly module for instantaneous sampling without the need for curvettes

Quick connect light source for low maintainence

Cyberscan TB 1000

- Up to 3-point push-button calibration
- For optimum full-range accuracy of ±2 % full scale
- Auto-ranging
- For fast response and best resolution (up to 0.01 NTU) over wide measurement range
- Auto-CAL compliant to ISO and GLP standards
- Prompts at user-defined interval to ensure regularly scheduled recalibration
- GLP-compliant time/date stamp
- Self-diagnostic

Large custom-designed LCD

Sturdy carry case allows you to pack and go

TN 100

- Full range lab-accurate results with 4 points push-button calibration
- 1200 tests on a single set of AAA batteries with advance power management design
- Lightweight, waterproof to IP67 standard & floats on water
- ISO 7027 compliant & designed to US EPA approved non-formazin standards
- Comes complete in sturdy carry kit with calibration standards, curvettes, batteries & instruction manual

Applications

Ideal for beverage production, drinking water, swimming pool, aquariums, aquaculture and environmental applications.

Turbidity Meters Specifications		CyberScan Deluxe Bench TB 1000	Waterproof Turbidity Meter Single-Display TN 100
Measuring Parameter		Turbidity	
Highlights		Turbidity bench, GLP, RS232	Light weight, IP67 waterproof meter
Principle		Nephelometric non-ratio/ISO7027 compliant	
Range		0 to 1000 NTU	
Automatic Range Selection		0.00 to 9.99 NTU 10.0 to 99.9 NTU 100 to 1000 NTU	0.01 to 19.99 NTU 20.0 to 99.9 NTU 100 to 1000 NTU
Resolution		0.01 NTU (0 to 9.99 NTU) 0.1 NTU (10 to 99.9 NTU) 1 NTU (100 to 1000 NTU)	0.01 NTU (0 to 19.99 NTU) 0.1 NTU (20.0 to 99.9 NTU) 1 NTU (100 to 1000 NTU)
Accuracy		±2 % of reading	±2 % of reading ±1 digit for 0 to 500 NTU ±3 % of reading ±1 digit for 501 to 1000 NTU
Repeatability		≤ ±1 % of reading	
Calibration		1 to 3 Points (automatic)	4 Points
Response Time		< 6 Secs for full step change	
Sample Volume		30 ml	10 ml
RS232 Output		Yes	–
Power Requirements		UL, CSA Approved 12 V DC adapter	4x 1.5 V 'AAA' (>1200 Reading)
Light Source		White light (tungsten) or infrared	Infrared-emitting diode (850 nm wavelength)
Operating Temperature		0 to 40 °C	0 to 50 °C
Dimensions (LxWxH) ; Weight	Meter	25.4 x 23.7 x 12.1 cm ; 1550 g	15.5 x 6.8 x 4.6 cm ; 200 g
	Boxed	35.6 x 31.8 x 24.1 cm ; 2340 g	35.6 x 16.5 x 10.9 cm ; 1250 g

Order Code	Part No.	Description
ECTBDW100020	01X259106	CyberScan TB 1000 white light Turbidity bench meter (NTU) with calibration kit (ECTBDWCALKT) & 220 VAC power adapter (EC220ADA800)
ECTBDW100010	01X259105	CyberScan TB 1000 white light Turbidity bench meter (NTU) with calibration kit (ECTBDWCALKT) & 120 VAC power adapter (EC120ADA800)
ECTBDIR100020	01X259104	CyberScan TB 1000 infra-red Turbidity bench meter (NTU) with calibration kit (ECTBDIRCALKT) & 220 VAC power adapter (EC220ADA800)
ECTBDIR100010	01X259103	CyberScan TB 1000 infra-red Turbidity bench meter (NTU) with calibration kit (ECTBDIRCALKT) & 120 VAC power adapter (EC120ADA800)
ECTN100IR	01X357301	Waterproof TN 100 infra-red Turbidimeter (NTU) with calibration kit (ECTN100CALKT), 3 sample vials (ECTN100CUVKT) & carrying case
Accessories		
ECTBDWCALKT	01X265101	Calibration kit set for ECTBDW1000 (0.02, 10.0, 1000 NTU)
ECTBDIRCALKT	01X265102	Calibration kit set for ECTBDIR1000 (0.02, 10.0, 1000 NTU)
ECTN100CALKIT	01X274802	Calibration kit set for ECTN100IR (0.02, 20.0, 100, 800 NTU)

<< Drinking Water

>> Swimming Pool

Colorimetry : :

The measurement of a parameter whose concentration is proportional to the colour intensity after addition of known volume of reagent.

About Colorimetric Measurement

Introduction to Colorimetry

Colorimetry is defined as the measurement of a parameter whose concentration is proportional (directly or inversely related) to color intensity after the addition of known volume of reagent(s).

Different chemical substances absorb different and varying visual light frequencies. Since the absorbance of a substance is proportional to its concentration i.e., a more concentrated solution gives a higher absorbance reading, therefore the concentration of a known solute can be measured using a colorimeter.

Eutech's latest range of handheld waterproof colorimeters measure chlorine (free and total), cyanuric acid, pH, chlorine dioxide, bromine and ozone. The applications include water analysis in swimming pools, spas, public utilities, industrial wastewater plants, municipal water, treated water, water conditioning systems and paper and pulp mills.

The effectiveness of the disinfectants used depends on your system's overall water chemistry, and not just on the disinfectants' concentrations alone. The following section provides a brief overview on the measurement of each parameter:

Bromine

Bromine is often used as a disinfectant in indoor or covered water systems. Due to lower volatility, bromine is more stable in water than chlorine. Compared to chlorine, the main advantages of bromine are reduced odour, and skin and eye irritation. In addition, bromine remains effective at high temperatures and its disinfecting efficiency is not affected by pH fluctuations. The disadvantages are that bromine is more expensive than chlorine and it cannot be stabilised for outdoor use.

Eutech's C 104 colorimeter measures bromine over the range of 0 ppm to 13.5 ppm.

Chlorine

Chlorine and chlorine-release compounds are frequently used as disinfectants in swimming pools, drinking water and other water treatment systems. Routine chlorination kills harmful micro-organisms. The disinfection efficiency is a direct function of the level of free chlorine in a system. Total chlorine is the sum of combined and free chlorine.

In applications where there is human contact with the water e.g. in swimming pools and spas, it is essential that the right amount of chlorine is present. Insufficient chlorine will decrease the disinfectant efficiency; while excess chlorine will cause skin and eye irritation and become a health hazard.

Eutech's C 401, C 301 and C 201 colorimeters measure free and total chlorine over the range of 0 mg/L to 6 mg/L.

Chlorine Dioxide

The use of chlorine dioxide as a disinfectant is seeing growth in many industrial applications. Unlike chlorine, chlorine dioxide remains a true gas dissolved in solution. The lack of any significant reaction of chlorine dioxide with water is partly responsible for its retaining its disinfecting effectiveness over a wide pH range. This property makes it a logical choice for cooling systems operated in the alkaline pH range, or cooling systems with poor pH control. Other applications for chlorine dioxide include the food processing industry; the pulp and paper industries, and the potable water and waste treatment industries.

Eutech's C 103 colorimeter measures chlorine dioxide over the range of 0 ppm to 11.4 ppm.

Ozone

Ozone is one of the strongest and most rapid oxidisers and disinfectants available. Ozone does not require any stabiliser. It does not corrode nor cause scaling. In addition, ozone has no smell, does not cause skin nor eye irritation and does not pose a health hazard. Although more expensive than traditional disinfectants like chlorine and bromine, because it does not cause corrosion nor scaling, the long-term maintenance cost of a water system which uses ozone as a disinfectant may be reduced compared to using chlorine. Ozone is gaining popularity in top spas and certain swimming pools.

Eutech's C 105 colorimeter measures ozone over the range of 0 ppm to 4.1 ppm.

Cyanuric Acid

In applications where chlorine is used for disinfection, cyanuric acid is often present as a chlorine stabiliser. Low levels of cyanuric acid are beneficial as they prevent wastage of free chlorine by the sun's UV rays. High levels of cyanuric acid cause the chlorine to take a longer time to kill the micro-organisms. It is important to test your water sample to determine how much cyanuric acid should be added to maximise chlorine efficiency.

Eutech's C 401 and C 102 colorimeters measure cyanuric acid over the range of 5 ppm to 90 ppm.

pH

The pH value affects the amount of free chlorine that is formed, and therefore determines the effectiveness of chlorine as a disinfectant. As pH increases, the disinfecting power of chlorine decreases. High pH causes scaling of water surfaces, pipework and fittings; this may result in cloudy water. Low pH can corrode metals in pipework and fittings; this may cause metal oxides to stain water surfaces.

Eutech's C 401, C 301 and C 101 colorimeters measure pH over the range of 5.9 - 8.2.

<< Spa

>> Paper Mill

Fuss-free and easy to use with no need for pre-calibration! Eutech's range of colorimeter provides quality, highly-repeatable results in just three simple steps. Each colorimeter comes complete with reagents and sample vials in a rugged carrying case – convenient for testing in the field.

Three Easy Steps

Step 1: To blank the meter, place a vial of sample liquid into the meter's sample well. Press the 'ZERO' button. The meter flashes 'STDBY' while blanking is in progress and displays 'ZERO' to confirm that blanking is complete

Step 2: Add reagent into sample vial (according to the specified parameter test procedure). Secure vial in meter sample well

Step 3: Press 'READ/ ENTER' to measure desired parameter

C 401; C 301; C 201; C 105; C 104; C 103; C 102 and C 101 Colorimeters

Free & Total Chlorine/Cyanuric Acid/pH ; Free & Total Chlorine/pH ; Free & Total Chlorine ; Ozone ; Bromine ; Chlorine Dioxide ; Cyanuric Acid ; pH

- Excellent test-to-test repeatability, auto-ranging and convenience with only one-vial-one-sachet per test
- Fuss-free meter operation with one-time blanking for all parameters and ranges and no pre-calibration required for chlorine and cyanuric acid
- No detachable parts, no flip covers – high quality customised vials fit perfectly into the sample vial
- Chlorine measurements are based on US EPA-approved DPD method
- Custom formulated high quality powder reagents provide excellent accuracy, repeatability and stability
- 100 % dustproof and waterproof to IP67 standards
- Advanced power management with more than 3000 tests per set of four new 'AAA' alkaline batteries and auto-off function

Applications

• Swimming pools • Spas • Public utilities • Industrial wastewater plants • Municipal water • Treated water • Water conditioning systems • Paper and pulp mills

Colorimeters Specifications				Colorimeters							
				C 401	C 301	C 201	C 105	C 104	C 103	C 102	C 101
	Range	Resolution	Accuracy								
Chlorine, Free & Total	0 to 1.99 ppm	0.01 ppm	±0.02 ppm	✓	✓	✓	–	–	–	–	–
	2.0 to 6.0 ppm	0.1 ppm	±0.2 ppm								
pH	5.9 to 8.2 pH	0.1 pH	±0.1 pH	✓	✓	–	–	–	–	–	✓
Cyanuric Acid	5 to 90 ppm	1 ppm	±4 ppm	✓	–	–	–	–	–	✓	–
Chlorine Dioxide	0 to 3.79 ppm	0.01 ppm	±0.02 ppm	–	–	–	–	–	✓	–	–
	3.8 to 11.4 ppm	0.1 ppm	±0.2 ppm								
Bromine	0 to 4.49 ppm	0.02 ppm	±0.03 ppm	–	–	–	–	✓	–	–	–
	4.5 to 13.5 ppm	0.2 ppm	±0.3 ppm								
Ozone	0 to 1.39 ppm	0.01 ppm	±0.02 ppm	–	–	–	✓	–	–	–	–
	1.4 to 4.1 ppm	0.1 ppm	±0.2 ppm								
Measurement Method	Photometric										
Light Source	Light emitting Diode (LED)										
Wavelength	525 nm										
Detector	Silicon photodiode										
Absorbance Range	0 to 2.5 Abs										
Photometric Precision	±0.0015 Abs										
Calibration Points	User-selectable; 1 Point per colorimetric test										
Display	4-Digit 14-segments customised liquid crystal display with annunciations										
Sample Vials	Borosilicate glass with screw caps, fill line and indexing mark Height x diameter: 51 x 25 mm (2 x 1 in)										
Sample Required	10 ml (0.33 oz)										
Operating Temperature Range	0 to 50 °C										
Sample Temperature Range	0 to 50 °C										
Operating Humidity Range	0 to 90 % RH Non-condensing at 30 °C										
Power Supply	4x 'AAA' Alkaline batteries										
Battery Life	> 3000 Tests										
Electromagnetic Compliance (EMC)	Emitted interference - EN 61326 immunity to interference - EN 61326										
Enclosure Rating	IP67										
Insulation Rating	Pollution degree 2										
Dimensions (LxWxH) ; Weight – Meter	68 x 155 x 46 cm ; 200 g										
Dimensions (LxWxH) ; Weight – Boxed	160 x 350 x 120 cm ; 1250 g										

Order Code	Part No.	Description
ECC401	01X376906	Waterproof free chlorine, total chlorine, cyanuric acid & pH colorimeter kit set with reagents (94X377001, 94X377002, 94X377003 & 94X377004) & carrying case
ECC301	01X376905	Waterproof free chlorine, total chlorine & pH colorimeter kit set with reagents (94X377001, 94X377003 & 94X377004) & carrying case
ECC201	01X376904	Waterproof free chlorine, total chlorine colorimeter kit set with reagents (94X377001& 94X377002) & carrying case
ECC105	01X376917	Waterproof ozone colorimeter kit set with reagents (94X377002) & carrying case
ECC104	01X376916	Waterproof bromine colorimeter kit set with reagents (94X377002) & carrying case
ECC103	01X376915	Waterproof chlorine dioxide colorimeter kit set with reagents (94X377001 & 94X377005) & carrying case
ECC102	01X376903	Waterproof cyanuric acid colorimeter kit set with reagents (94X377003) & carrying case
ECC101	01X376902	Waterproof pH colorimeter kit set with reagents (94X377004) & carrying case
Accessories		
94X377001	94X377001	Free chlorine (DPD) reagent kit, pack of 100 pouches
94X377002	94X377002	Total chlorine (DPD) reagent kit, pack of 100 pouches
94X377003	94X377003	Cyanuric acid reagent kit, pack of 100 pouches
94X377004	94X377004	pH indicator (phenol red) reagent kit, 1 bottle
94X377005	94X377005	Chlorine dioxide (glycine) reagent kit, pack of 100 pouches
ECTN100CUVKIT	01X274902	Sample vials – pack of 3 vials

Temperature : :

The degree of hotness or coldness of a body or environment; A measure of the average energy possessed by the molecules of a body.

About Temperature Measurement

Introduction to Thermometry

Thermometry is the measurement of temperature or temperature changes. Temperature measurements are necessary in various industries ranging from agriculture, HVAC, chemical and manufacturing, food and beverage, boiler and cooling towers, schools and laboratories to water and wastewater treatment. There are various types of thermometers that rely on different principles of measurement.

Eutech offers the user-friendly and feature-packed EcoScan temperature meters Temp 5, Temp 6 and Temp JKT for routine indoor and outdoor temperature measurements. The EcoScan Temp 5 and Temp 6 are paired with the 100K thermistor temperature probe and 3-wire RTD Pt 100 temperature probe respectively.

What is a Thermocouple?

Thermocouple probes are composed of two dissimilar metals, joined to produce a voltage at a given temperature. Thermocouple thermometers measure, amplify, linearise and display the proportional voltage signal generated by the thermocouple probe. Thermocouples are used in most general purpose applications where precision is not a top priority. They offer a wide temperature range and come in a variety of metal combinations or calibrations.

The J, K and T are three of the most common calibrations available. Although the maximum temperature differs with the diameter of the wire used in the thermocouple, each calibration consists of a different temperature range and environment.

Type J and K Probes:
±1 to 4 °C or ±0.4 % probes of reading above 0 °C, whichever is greater

Type T Probes:
±0.5 to 2 °C or 0.4 % of reading above 0 °C, whichever is greater

Thermocouple Selection

Some of the following criteria determine the selection of a suitable thermocouple:

- Temperature range
- Chemical resistance of the thermocouple or sheath material
- Abrasion and vibration resistance
- Installation requirements (may need to be compatible with existing equipment; existing holes may determine probe diameter)

The EcoScan Temp JKT is designed for measurement with the Type J, Type K and Type T thermocouples. The meter is capable of measuring a wide range of temperatures and is rugged, dust-proof and splash-proof to IP54 standards, making it suitable for most industrial applications.

Thermocouple Probe Junction Types

Sheaths with small diameters have faster response times. Sheaths with larger diameters have longer life and are better for measuring higher temperatures.

Probe Sheath Materials

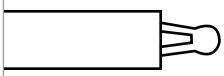
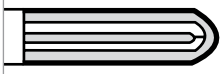
INCONEL® 600 Sheath is ideal for severely corrosive environments and at elevated temperatures. It resists progressive oxidation. Maximum operating temperatures are: continuous – 1149 °C, intermittent –1371 °C.

304 SS Sheath is for general purpose use. It is corrosion-resistant, and is good for food service and biological applications. Maximum operating temperatures: continuous – 899 °C, intermittent – 1399 °C.

316 SS Sheath has higher corrosion resistance than 304 SS. It withstands some strong acids. Maximum operating temperatures: continuous – 899 °C, intermittent – 1371 °C.

SS Sheath with Coating of HDPE with grounded junction is ideal with corrosive liquids and atmospheres. It has a longer response time and can measure temperatures to 260 °C.

Eutech offers various probes with ungrounded junction and 304 SS sheath. Models include the Type J and Type K probes available for general purpose immersions in liquids or penetration in meats, plastic and other semi-soft materials.

	**Exposed Junction** has the fastest response time making it ideal for measuring rapid temperature changes. Clear coating on most models provides a humidity barrier for the thermocouple. However, it is not recommended for use with corrosive fluids or atmospheres.
	**Ungrounded Junction** has a welded junction insulated from the protective sheath and is electrically isolated. Longer response time is expected. Recommended use for conductive solutions or where isolation of the measuring circuitry is required.
	Grounded Junction has a junction welded to tip of sheath. Wires are completely sealed from contaminants. Good response time.

What is a Thermistor?

Thermistors are thermally sensitive resistors which change electrical resistance due to temperature changes. They have predictable characteristics and offer long term stability. Although response times are generally faster than other types of probes, thermistors have a limited temperature range that usually cannot exceed 150 °C.

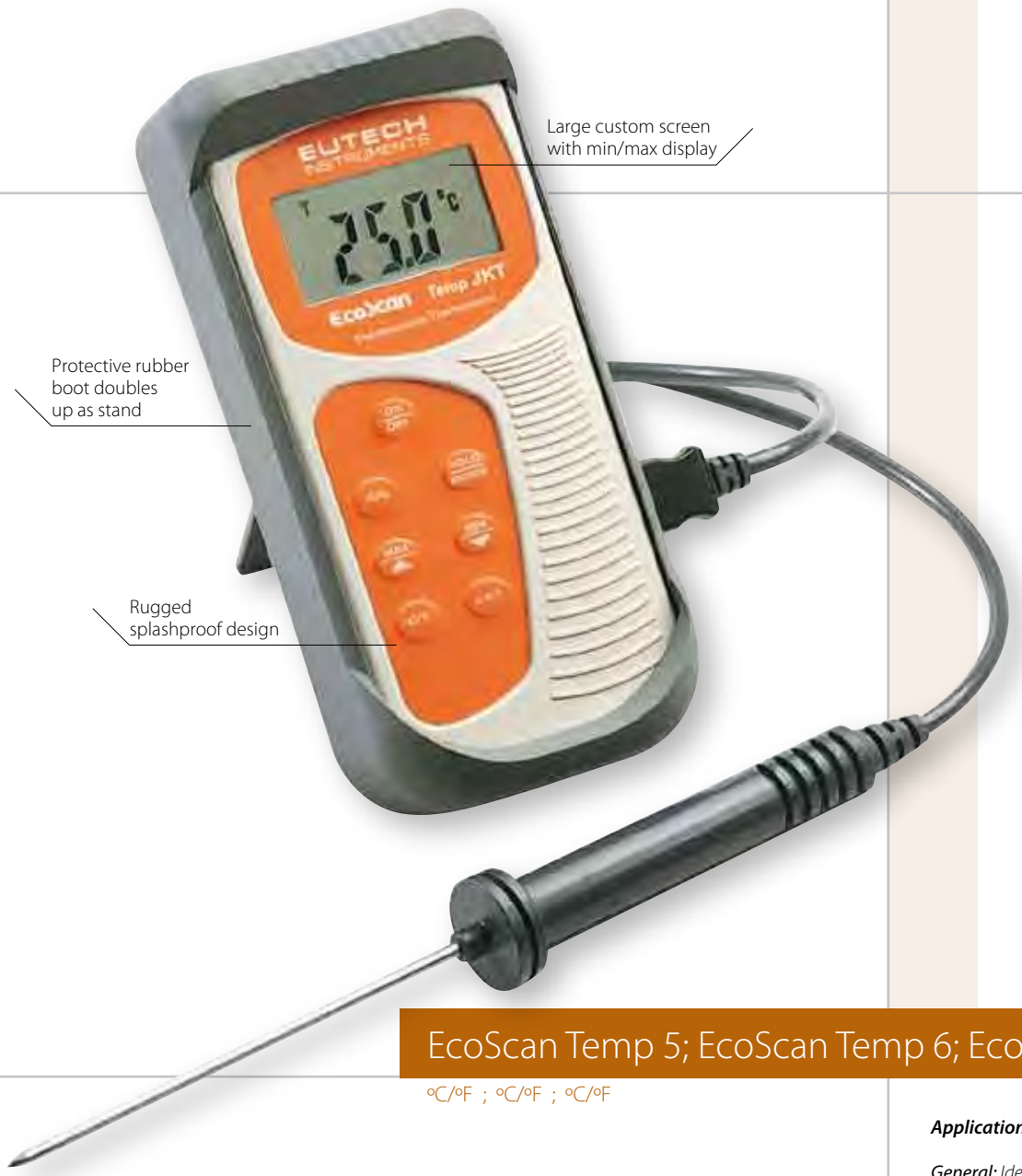
The Eutech EcoScan Temp 5 has a measurement range of 40.0 to 125.0 °C using the 100K thermistor temperature probe.

What is RTD?

RTD or Resistance Temperature Detector refers to the measurement of temperature by measuring the change in electrical resistance across metal wires. This resistance value is interpreted by an RTD thermometer. Although the RTD wire can be made of any metal, platinum is preferred for its excellent repeatability, stability and resistance to corrosion and chemicals. RTDs are more accurate and stable compared to other probes such as thermocouples. However they are not recommended for extreme temperatures. An RTD probe is chosen where accuracy and repeatability are important.

The Eutech EcoScan Temp 6 is a RTD temperature meter which can be used with the 3-wire RTD Pt 100 temperature probe for accurate and reliable measurements.

Ideal for routine indoor and outdoor temperature testing, the EcoScan Temp 5, Temp 6 and Temp JKT are durable, value-for-money tools with user-friendly features.



EcoScan Temp 5; EcoScan Temp 6; EcoScan Temp JKT

°C/°F ; °C/°F ; °C/°F

- Selectable °C/°F readout
- Non-volatile memory backup
- Factory calibrated
- Offset adjustment
- Self-diagnostic messages
- Easy push-button calibration
- HOLD and selectable auto power-off function
- EcoScan Temp 5 uses 100K thermistor probes
- EcoScan Temp 6 uses 3-wire RTD PT100 probes
- EcoScan Temp JKT features versatility with interchangeable J, K, T probes

Applications

General: *Ideal for applications that require the measurement and monitor of temperature of liquid, solid, semi-solid or gel.*

Industrial: *Can be used in photo developing, chemical and plating industries and all applications that require temperature measurement. Can be used as a practical substitute for glass thermometers in food processing or agriculture applications. The min/max feature is useful for HVAC applications where the measurement and monitor of heating and cooling efficiency is required. Other applications include flue gas temperatures, boiler water, heater jacket temperatures, inlet and outlet water heater temperatures, etc.*

Educational: *Ideal for students with its user-friendly, easy push-button features. No worries about broken glass or mercury spillage.*

Temperature Handheld Meters Specifications		EcoScan Single-Display				
		Temp JKT			Temp 6	Temp 5
Measuring Parameter		ºC/ºF				
Highlights		Type J Thermocouple	Type K Thermocouple	Type T Thermocouple	3 Wire RTD pt100 temperature probe	100K Thermistor temperature probe
Temperature	Range	-200 to 1000 ºC	-250 to 1372 ºC	-250 to 400 ºC	-200.0 to 850.0 ºC	-40.0 to 125.0 ºC
	Resolution	1 ºC (299.9 ºC < t < -99.0 ºC) 0.1 ºC (-99.9 ºC < t < 299.9 ºC)			±0.1 ºC (-99.9 to 199.9 ºC) ; 1 ºC (range < -99.9 ºC and range > 199.9 ºC)	0.1 ºC
	Accuracy	±0.25 % of reading + 1 ºC (t < -99.9 ºC) ±0.2 % of reading + 0.5 ºC (t > -99.9 ºC)			±0.2 ºC (-99.9 to 199.9 ºC) 2 ºC (range <-99.9 ºC and range >199.9 C)	±0.2 ºC
Offset Adjustment		±10 ºC			±5 ºC	
Hold Function		Yes				
Auto-Off (Selectable)		Yes				
Low Battery Indicator		Yes				
Display		Single Custom LCD				
Operating Temperature		-10 to +50 ºC			0 to 50 ºC	
Input		2 Pin ANSI mini connector			3 Pin panel mount connector	¼ Inch phono plug
Power Requirements		4x 1.5 V 'AAA' Alkaline batteries				
Battery Life		> 200 Hours				
Dimensions (LxWxH) ; Weight	Meter	14 x 7 x 3.5 cm ; 200 g				
	Boxed	24 x 17 x 8 cm ; 550 g				

Order Code	Part No.	Type	Description
ECTEMPJKT	01X270401	J, K, T	EcoScan Temp JKT thermocouple type J, K, T temperature meter (meter only), probe to be ordered separately
ECTEMP601	01X256503	RTD	EcoScan Temp 6 3-wire RTD PT100 temperature meter with probe ECTEM6TEM01R (max. 150 ºC)
ECTEMP501	01X256502	Thermistor	EcoScan Temp 5 100K thermistor temperature meter with probe ECTEM5TEM01P
Accessories			
ECTPGLPJ01M	01X220001	Type J	General purpose probe (for immersion into liquids), 1 m cable, ungrounded
ECTPPENJ01M	01X220002	Type J	Penetration probe (for penetrating meat, plastic and semi-soft materials), 1 m cable, ungrounded
ECTPGLPK01M	01X220101	Type K	General purpose probe (for immersion into liquids), 1 m cable, ungrounded
ECTPPENK01M	01X220102	Type K	Penetration probe (for penetrating meat, plastic and semi-soft materials), 1 m cable, ungrounded
ECTPSURK01M	01X220103	Type K	Surface probe (for direct contact on hot surfaces), 1 m cable, ungrounded
ECTEM6TEM01R	01X021814	RTD	3 wire RTD Pt100 Temperature probe, ungrounded, SS304 (max temperature 150 °C)
ECTEM5TEM01P	01X021811	Thermistor	100K thermistor Temperature probe, ungrounded, SS304

<< Industrial Boilers

>> Environmental Monitoring

Multi-Parameter : :

Do more with less – intelligent instruments that allow you to measure multiple parameters.

A Eutech Star Buy! Combining the key features of the CyberScan 600 series, Eutech's CyberScan PCD 650 enables concurrent measurement of three parameters in addition to temperature, all of which can be simultaneously displayed on the comprehensive customized LCD screen. With the incorporated IrDA wireless technology, data transfer from meter to computer is a breeze.

CyberScan PCD 650

pH/mV/Ion/Conductivity/TDS/Resistivity/Salinity/Dissolved Oxygen/°C/°F

Available in complete kit set

Waterproof external power input

Data acquisition software included

Applications

Environmental: *Use to test water quality, monitor health of aquatic ecosystems, survey surface and ground water drinking supplies, and meet EPA regulations.*

Water Quality Testing: *For analysing water hard water, drinking water, effluent water, and incoming process water. Ideal for all types of quality assurance and water quality testing.*

Industrial: *For checking metal finishing, cooling tower water, printing fountain solutions, boiler water, brines, rinse tanks, ponds, pollution control, recirculating systems, waste water and industrial process systems. Useful for food analysis and quality assurance testing.*

Aquacultural: *Use to monitor oxygen levels in catfish and shrimp farming; game stocking ponds; ornamental fish tanks and ponds; and in other fish farming applications.*

Wide Measurement Ranges

- Measures accuracy of up to ±0.002 pH and resolution of up to 3-decimal points
- Accepts 2-cell and 4-cell Conductivity probe, enabling it to measure a wide Conductivity range of up to 500 mS/cm – meter even measures pure water!
- Measures 90.00 mg/L in DO concentration and 600 % in DO saturation – one of the widest Dissolved Oxygen measurement ranges offered in the handheld market today!

User-Friendly

- Rugged and waterproof for applications in harsh environments
- Step-by-step prompts that guide users through set-up, calibration and trouble-shooting
- High/low alarm limits

Advanced Data-Management

- Meter automatically logs up to 500 readings with time and date in GLP-compliant format
- RS232 through LED*, IrDA wireless communications technology
- Non-volatile memory protects information and meter settings, even when batteries run out
- Password protection to prevent tampering

** RS232 (LED) interface adapter available as separate accessory (order code: 01X344201)*

ATC MTC GLP AUTO-BUFFER AUTO-CAL IrDA RS232

Eutech's CyberScan PC 650 brings together the two most popular electrochemistry parameters into one handheld, allowing you to measure pH, mV, ion, conductivity, TDS, resistivity, salinity and temperature with one meter. Featuring a one-glance-tells-all screen which displays two parameters plus temperature simultaneously along with electrode information and calibration data, the PC 650 is rugged, waterproof and comes with a mega-memory space that stores up to 500 data-sets with time and date.

Wireless data transfer

Sturdy rubber boot doubles up as meter stand

Velcro strap for firmer grip

CyberScan PC 650

pH/mV/Ion/Conductivity/TDS/ Resistivity/Salinity/°C/°F

Wide Measurement Ranges

- Measures accuracy of up to ±0.002 pH and resolution of up to 3-decimal points
- Accepts and auto-detects 2-cell and 4-cell Conductivity probe, enabling it to measure a wide Conductivity range of up to 500 m/s – meter measures pure water!

User-Friendly

- Rugged and waterproof for applications in harsh environments
- Step-by-step prompts that guide users through set-up, calibration and trouble-shooting

Advanced Data-Management

- Meter automatically logs up to 500 readings with time and date in GLP-compliant format
- RS232 through LED*, IrDA wireless communications technology
- Non-volatile memory protects information and meter settings, even when batteries run out
- Password protection to prevent tampering

** RS232 (LED) interface adapter available as separate accessory (order code: 01X344201)*

ATC | MTC | GLP | AUTO-BUFFER | AUTO-CAL | IrDA | RS232 | CE

Applications

Environmental/Agricultural: *For ecology studies, aquaculture and hydroponics.*

Water Quality Testing: *For analysing water hard water, drinking water, effluent water, and incoming process water. Ideal for all types of quality assurance and water quality testing.*

Industrial: *For checking metal finishing, cooling tower water, printing fountain solutions, boiler water, brines, rinse tanks, ponds, pollution control, recirculating systems, waste water and industrial process systems. Useful for food analysis and quality assurance testing.*

Educational: *Ideal for quick pH and Conductivity checks in laboratories and schools.*

Collecting multi-parameter data in the field is a breeze with Eutech's CyberScan 650 handheld series. The CyberScan PD 650 delivers quick, lab-accurate measurements of pH, mV, ion and dissolved oxygen simultaneously, and auto-logs up to 500 data-sets with date and time in GLP-compliant format. A comprehensive screen displays pH, mV or ion with dissolved oxygen and temperature readings in addition to electrode status reports and calibration information – all of which can be wirelessly transferred from meter to PC via the incorporated IrDA port.

Wireless data transfer

CyberScan PD 650

pH/mV/Ion/Dissolved Oxygen/°C/°F

Sturdy rubber boot
doubles up as meter stand

Velcro strap
for firmer grip

Applications

Environmental: *Use to test water quality, monitor health of aquatic ecosystems, survey surface and ground water drinking supplies, and to meet EPA regulations.*

Educational: *Ideal for quick, accurate DO readings in laboratories and schools.*

Industrial: *Ideal for checking quality of plant water intake and discharge, wastewater and water treatment, recirculating systems and industrial process systems. Ideal for pH checks in water conditioning plants, cooling towers, plating and finishing operations, and chemical process verification.*

Aquacultural: *Use to monitor oxygen levels in catfish and shrimp farming; game stocking ponds; ornamental fish tanks and ponds; and in other fish farming applications.*

Wide Measurement Ranges
- Measures accuracy of up to ±0.002 pH and resolution of up to 3-decimal points
- Measures 90.00 mg/L in DO concentration and 600 % in DO saturation – one of the widest Dissolved Oxygen measurement ranges offered in the handheld market today!

User-Friendly
- Rugged and waterproof for applications in harsh environments
- Step-by-step prompts that guide users through set-up, calibration and trouble-shooting

Advanced Data-Management
- Meter automatically logs up to 500 readings with time and date in GLP-compliant format
- RS232 through LED*, IrDA wireless communications technology
- Non-volatile memory protects information and meter settings, even when batteries run out
- Password protection to prevent tampering

** RS232 (LED) interface adapter available as separate accessory (order code: 01X344201)*

Equipped with sophisticated functions of laboratory meters, Eutech's CD 650 is IP67 waterproof and built for harsh applications. Intuitive with built-in guidance prompts and trouble-shooting tips, the meter comes with advanced wireless communications technology for easy meter-to-PC data transfer, and allows the simultaneous measurement of conductivity, TDS, resistivity or salinity with dissolved oxygen and temperature.

Available in complete kit set

Waterproof external power input

Data acquisition software included

CyberScan CD 650

Conductivity/TDS/Resistivity/ Salinity/Dissolved Oxygen/°C/°F

Applications

Environmental: *Use to test water quality, monitor health of aquatic ecosystems, survey surface and ground water drinking supplies, hydroponics, and fertilizer/ chemical concentrations and meet EPA regulations.*

Industrial: *Ideal for checks on the quality of plant water intake and discharge, wastewater and water treatment, recirculating systems and industrial process systems.*

Aquacultural: *Use to monitor oxygen levels in catfish and shrimp farming; game stocking ponds; ornamental fish tanks and ponds; and in other fish farming applications.*

General: *Monitor Dissolved Solids or Conductivity levels quickly and easily in laboratories, field, schools and educational environments.*

Wide Measurement Ranges
- Accepts and auto-detects 2-cell and 4-cell Conductivity probe, enabling it to measure a wide Conductivity range of up to 500 mS/cm – meter even measures pure water!
- Measures 90.00 mg/L in DO concentration and 600.0 % in DO saturation – one of the widest Dissolved Oxygen measurement ranges offered in the handheld market today!

User-Friendly
- Rugged and waterproof for applications in harsh environments
- Step-by-step prompts that guide users through set-up, calibration and trouble-shooting

Advanced Data-Management
- Meter automatically logs up to 500 readings with time and date in GLP-compliant format
- RS232 through LED*, IrDA wireless communications technology
- Non-volatile memory protects information and meter settings, even when batteries run out
- Password protection to prevent tampering

** RS232 (LED) interface adapter available as separate accessory (order code: 01X344201)*

ATC MTC GLP AUTO-CAL IrDA RS232

Toggle between DO (% sat or mg/L) and pH with a simple keypress. No waiting time is required with the galvanic probe that delivers quick, stable response. With adjustable backlit large dual-display LCD for optimised view, this multi-parameter meter is ideal for outdoor field measurement in dim surroundings.

CyberScan PD 300

pH/Dissolved Oxygen/°C/°F

Applications

Industrial: *Ideal for checking quality of plant water intake and discharge, wastewater and water treatment, recirculating systems and industrial process systems. Ideal for pH checks in water conditioning plants, cooling towers, plating and finishing operations, and chemical process verification.*

Aquacultural: *Use to monitor oxygen levels in catfish and shrimp farming; game stocking ponds; ornamental fish tanks and ponds; and in other fish farming applications.*

Environmental: *Use to test water quality, monitor health of aquatic ecosystems, survey surface and ground water drinking supplies, and to meet EPA regulations.*

Educational: *Ideal for quick, accurate DO readings in laboratories and schools.*

- The multi-parameter PD 300 measures pH, Dissolved Oxygen and Temperature
- Up to 5-point pH push button calibration
- 2-point calibration for Dissolved Oxygen measurement
- Advanced setup mode possible
- Rugged carry-all meter kits available

pH, conductivity and temperature measurements all conveniently packed into one handheld meter. The CyberScan PC 300 features easy interchangeability of specialty electrodes for specific applications; CyberScan PC 10 comes with a combined multi-sensor submersible probe – no need to change probes for to measure different parameters!

Available as a
complete kit version

CyberScan PC 10; CyberScan PC 300

pH/ºC/Conductivity ; pH/ºC/ºF/Conductivity/TDS

- Toggles between pH/Temperature and Conductivity/Temperature with the touch of a button PC 300 also measures TDS
- Waterproof to IP67 standard – meter floats for easy retrieval!
- Multi-point push-button calibration
- Auto-buffer recognition for pH calibration
- Auto-ranging for Conductivity measurements
- Meter prompts when reading has stabilised
- Large, easy to read LCD screen

ATC MTC AUTO-BUFFER

Applications

Industrial: *For checking metal finishing, cooling tower water, printing fountain solutions, boiler water, brines, rinse tanks, ponds, pollution control, recirculating systems, waste water and industrial process systems. Useful for food analysis and quality assurance testing.*

Water Quality Testing: *For analysing water hard water, drinking water, effluent water, and incoming process water. Ideal for all types of quality assurance and water quality testing.*

Environmental/Agricultural: *For ecology studies, aquaculture and hydroponics.*

Educational: *Ideal for quick pH and Conductivity checks in laboratories and schools.*

Multi-Parameter Handheld Meters Specifications		**PCD 650**	**PC 650**	**PD 650**	**CD 650**	**PD 300**	**PC 300**	**PC 10**
Measuring Parameter		pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/ °C/°F	pH/mV/Ion/ Conductivity/TDS/ Resistivity/Salinity/ °C/°F	pH/mV/Ion/ Dissolved Oxygen/ °C/°F	Conductivity/TDS/ Resistivity/Salinity/ Dissolved Oxygen/ °C/°F	pH/Dissolved Oxygen/°C/°F	pH/°C/°F/ Conductivity/TDS	pH/°C/ Conductivity
Highlights		Waterproof, GLP, RS232, IrDA, multi-parameter display				Waterproof with back lighting	Waterproof, speciality probe compatible	Waterproof, combined multi-submersible probe
pH	Range	-2.000 to 20.000 pH			–	-2.00 to 16.00 pH		0.00 to 14.00 pH
	Resolution	0.1/0.01/0.001 pH			–	0.01 pH		
	Accuracy	±0.002 pH			–	±0.01 pH		
	Calibration Points	1 (Offset) to 6 points			–	5		3
	Auto-Buffer Recognition	Yes			–	Yes		
	Slope & Offset Display	Yes			–	Yes		No
Ion	Range	0.001 to 19900			–			
	Resolution	2 or 3 digits			–			
	Accuracy	0.5 % Full scale (monovalent) 1 % Full scale (divalent)			–			
	Calibration Points	Up to 8			–			
mV	Range	±2000.0 mV			–			
	Resolution	0.1 mV			–			
	Accuracy	±0.2 mV			–			
Temperature	Range	-10.0 to 110.0 °C/14.0 to 230.0 °F (Meter)				-10.0 to 110.0 °C/14.0 to 230.0 °F		0.00 to 100.0 °C
	Resolution	0.1 °C/0.1 °F				0.1 °C/0.1 °F		0.1 °C
	Accuracy	±0.5 °C/±0.9 °F				0.3 °C	±0.5 °C/±0.9 °F	±0.5 °C
Conductivity	Range	.. to 500.0 mS/cm		–	.. to 500.0 mS/cm	–	.. to 19.99/199.9/ 1999 µ/cm; 0 to 19.99/ 199.9 mS/cm	0 to 19.99/199.9/ 1999 µ/cm; 0 to 19.99 mS/cm
	Resolution	0.05 % Full scale		–	0.05 % Full scale	–	0.01/0.1/1 µS/cm; 0.01/0.1 mS/cm	0.01/0.1/1 µS/cm; 0.01 mS/cm
	Accuracy	±1 % Full scale + 1 LSD		–	±1 % Full scale + 1 LSD	–	±1 % Full scale + 1 digit	
	Calibration Points	4 (1 Per range) auto, 5 (1 Per range) manual		–	4 (1 Per range) auto, 5 (1 Per range) manual	–	5	4
	Cell Constant (K)	0.010 to 10.000		–	0.010 to 10.000	–	1.0	
	Temperature Coefficient	Linear & pure		–	Linear & pure	–	0.0 to 10.0 % (Adjustable)	2.00 %
	Normalisation Temperature	15 to 30 °C		–	15 to 30 °C	–	15.0 to 30.0 °C (Adjustable)	25 °C
	Auto-Ranging	Yes		–	Yes	–	Yes	
TDS	Range	.. to 500.0 ppt		–	.. to 500.0 ppt	–	0 to 9.99/99.9/999 ppm ; 0 to 9.99/99.9 ppt ; Max of 199.9 ppt based on factor setting	–
	Resolution	0.05 % Full scale		–	0.05 % Full scale	–	0.01/0.1/1 ppm ; 0.01/0.1 ppt	–
	Accuracy	±1 % Full scale + 1 LSD		–	±1 % Full scale + 1 LSD	–	±1 % Full scale + 1 LSD	–
	Calibration Points	5		–	5	–	5	–
	Conversion Factor	0.40 to 1.0		–	0.40 to 1.0	–	0.40 to 1.0	–
	Auto-Ranging	Yes		–	Yes	–	Yes	

Multi-Parameter Handheld Meters Specifications		PCD 650	PC 650	PD 650	CD 650	PD 300	PC 300	PC 10
Dissolved Oxygen	Range	0.00 to 90.00 mg/L or ppm	–	0.00 to 90.00 mg/L or ppm		0.00 to 20.00 mg/L or ppm	–	
	Resolution	0.01 mg/L ; 0.01 ppm	–	0.01 mg/L ; 0.01 ppm			–	
	Accuracy	±0.2 mg/L	–	±0.2 mg/L		±1.5 % Full scale	–	
	Calibration Points	1	–	1			–	
	Probe	Galvanic with integral temperature sensor	–	Galvanic with integral temperature sensor			–	
% Saturation of Oxygen	Range	0 to 600.0 %	–	0 to 600.0 %		0.0 to 200.0 %	–	
	Resolution	0.1 %	–	0.1 %		0.1 %	–	
	Accuracy	±2.0 %	–	±2.0 %		±1.5 % Full scale	–	
Salinity Correction	Range	0.0 to 50.0 ppt	–	0.0 to 50.0 ppt		0.0 to 50.0 ppt	–	
	Resolution	0.1 ppt	–	0.1 ppt		0.1 ppt	–	
	Method	Automatic	–	Automatic correction after manual input	Automatic	Automatic correction after manual input	–	
Barometric Pressure Correction	Range	450 to 825 mmHg or 59.9 to 109.9 kP	–	450 to 825 mmHg or 59.9 to 109.9 kPa		500 to 1499 mmHg or 66.6 to 199.9 kPa	–	
	Resolution	0.1 mmHg or 0.1 kPa	–	0.1 mmHg or 0.1 kPa			–	
	Method	Automatic correction with built-in sensor	–	Automatic correction with built-in sensor		Automatic correction after manual input	–	
Meter Features	Operating Temperature	0 to 50 °C						
	ATC	Yes						
	Hold Function	Yes						
	Ready Function	Yes						
	Auto-Off	2 to 30 Mins after last key pressed				20 Mins after last key pressed		
	Inputs	DC Phono sockets, BNC, 8 Pin connector, 6 pin connector	DC Phono sockets, BNC, 8 Pin connector,	DC Phono sockets, BNC, 6 Pin connector,	DC Phono sockets, 6 Pin connector, 8 Pin connector	BNC, 6 Pin connector		6 Pin connector
Power		4x 1.5 V 'AA' Alkaline batteries or 9 V DC Adapter, 500 mA				4x 1.5 V 'AAA' Batteries		
Battery Life		> 200 Hours		> 400 Hours	> 200 Hours	> 100 Hours		> 50 Hours
Dimensions (LxWxH) ; Weight	Meter	18.3 x 9.5 x 5.7 cm ; 460 g				19 x 10 x 6 cm ; 700 g	19 x 10 x 6 cm ; 320 g	
	Boxed	23.5 x 16 x 15.5 cm ; 800 g				34 x 40 x 10 cm ; 2200 g		

Order Code	Part No.	Description
ECPCDWP65044K	01X430902	Waterproof CyberScan PCD 650 pH/mV/Ion/Conductivity/TDS/Resistivity/Salinity/Dissolved Oxygen handheld meter with pH electrode ECFC7252203B, 4 cell Conductivity probe, Dissolved Oxygen probe, DAS software, power adapter & carrying kit set (all probes have 3 m cable length)
ECPCWP65043K	01X430602	Waterproof CyberScan PC 650 pH/mV/Ion/Conductivity/TDS/Resistivity/Salinity handheld meter with pH electrode ECFC7252203B, 4 cell Conductivity probe, DAS software, power adapter & carrying kit set (all probes have 3 m cable length)
ECPDWP65043K	01X430702	Waterproof CyberScan PD 650 pH/mV/Ion/Dissolved Oxygen handheld meter with pH electrode ECFC7252203B, Dissolved Oxygen probe, DAS software, power adapter & pH carrying kit set (all probes have 3 m cable length)
ECCDWP65043K	01X430802	Waterproof CyberScan CD 650 Conductivity/TDS/Resistivity/Salinity/Dissolved Oxygen handheld meter with 4-cell Conductivity probe, Dissolved Oxygen probe, DAS software, power adapter & carrying kit set (all probes have 3 m cable length)
ECPDWP30003K	01X267001	Waterproof CyberScan PD 300 pH/Dissolved Oxygen handheld meter (backlit) with pH electrode (ECDA9350603B), Dissolved Oxygen electrode (ECDOHANDYNEW), 1 assembled membrane cap housing, refilling electrolyte & pH carrying kit set (ECPHWPKIT)
ECPCWP30003K	01X262901	Waterproof CyberScan PC 300 pH/Conductivity/TDS handheld meter with pH electrode , Conductivity electrode, 2 electrode holders & carrying kit set (ECPCWPKIT)
ECPCWP1003K	01X268701	Waterproof CyberScan PC 10 pH/Conductivity handheld meter with pH/Conductivity combined electrode & carrying kit set (ECPCWPKIT)
ECPCWPKIT	01X266803	pH/Conductivity kit set – plastic carrying case comprises 1 x pH 7.00, 1413 mS, 12.88 mS KCl & 1 x deionised (rinse) water (60 ml)
ECPHWPKIT	01X266801	pH carrying kit set – plastic carrying case comprises 1 x pH 4.01, pH 7.00, storage solution & 1 x deionised (rinse) water (60 ml)
Accessories		
ECCONSEN91W	01X244702	2 stainless steel rings ultem-body electrode with ATC, cell constant K=1.0, 14x110 mm, 6-pin connector, 1 m cable
ECFC7252201B	01X099417	General purpose plastic-body double junction gel-filled pH combination electrode, 12x110mm, BNC connector, 1 m cable
ECDOHANDYNEW	01X239601	Galvanic Dissolved Oxygen electrode with ATC, 3 m cable
ECDA9350603B	93X218879	Submersible gel-filled pH combination electrode with 15 cm ABS guard; single annular ceramic junction, 3 m cable

Top-of-the-line, research-grade CyberScan PCD 6500 touchscreen meter measures and displays up to four channels at one time. With up to ten measurement parameters to choose from, the PCD 6500 features advanced design that prevents cross talk or other interference. Plus, comprehensive communications capabilities that allows you to send your data to any computer in the world via internet – directly from the meter!

CyberScan PCD 6500

pH/°C/°F/mV/Ion/Conductivity/TDS/ Resistivity/Salinity/Dissolved Oxygen/ BOD/OUR/SOUR

Direct printing of data during measurement

Secure log-in for up to ten users

Capable of auto five day BOD testing, OUR and SOUR with self-stirring probe that meets EPA compliance

- Up to four channels measured and displayed simultaneously without cross channel interference
- Wide pH and mV measurement range: -2.000 to 20.000 pH and ± 2000.0 mV
- 'Direct/indirect', 'known addition/subtraction' and 'analate addition/subtraction' Ion measurement methods in ppm, %, mg/mL and mole/L
- DO measurement includes five-day BOD testing, OUR, and SOUR and simple DO measurements
- Single-point and multi-point standardization for Conductivity, Resistivity, TDS and Salinity measurements using 2-cell and 4-cell probes. Built-in replatinising circuit
- Secure log-in for up to ten users

ATC MTC GLP AUTO-BUFFER AUTO-CAL IrDA RS232

Simplify lab work with the multi-channel capabilities of the Eutech CyberScan PC 6500. Advanced design ensures that readings are unaffected during cross-talk or interferences. Built-in replatinising circuit allows a quick, replatinisation procedure in no more than five minutes; while extensive communications capabilities allows you to send your information to any computer in any format you want!

World's first Windows® CE-driven colour touchscreen research-grade bench meter
Internet/ethernet-ready connection for direct on-line access
Stores up to 1000 data sets per parameter
View and display triple channels simultaneously without cross channel interference

Multiple communications capabilities

Single point and multi-point standardization for Conductivity, Resistivity, TDS and Salinity measurements

Extensive setup screens for easy customisation

CyberScan PC 6500

pH/°C/°F/mV/Ion/Conductivity/TDS/ Resistivity/Salinity

- Up to three channels measured and displayed simultaneously without cross channel interference
- Wide pH and mV measurement range: -2.000 to 20.000 pH and ± 2000.0 mV
- 'Direct/indirect', 'known addition/subtraction' and 'analate addition/subtraction' Ion measurement methods in ppm, %, mg/mL and mole/L
- Advanced real-time on-screen graphing function provides useful indication for specific measurements such as titration
- Extensive setup screens enables you to customise meter to your needs, e.g. cell constant, temperature coefficient, TDS factor, alarm limits and other functions
- Secure log-in for up to ten users

ATC MTC GLP AUTO-BUFFER AUTO-CAL IrDA RS232

Cross talk between pH and conductivity is never a problem with the Eutech CyberScan PC 6000. Extensive communications capabilities allows you to choose the way you want to send and receive data – using a USB port, wirelessly via the IrDA, through a local server via LAN connection, or over the internet to any computer in the world.

Multiple communications capabilities

CyberScan PC 6000

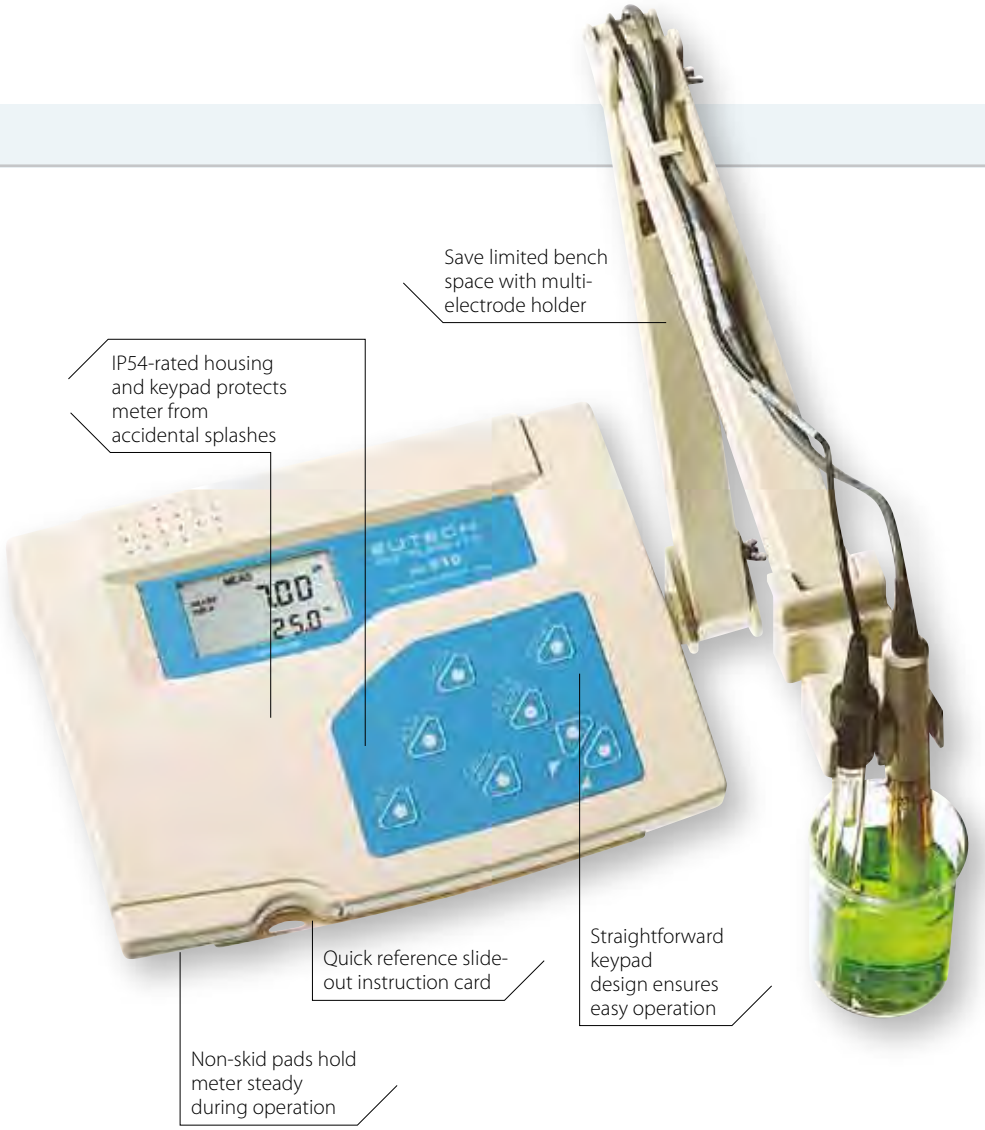
pH/°C/°F/mV/Conductivity/TDS/ Resistivity/Salinity

Internet/ethernet-ready connection for direct on-line access
World's first Windows® CE-driven touchscreen research-grade bench meter
21 CFR Part 11-compliant application software available *(software sold separately)*
Stores up to 1000 data sets per parameter
Effortless navigation with familiar Windows® user-interface
CyberScan
PC 6000
1799.0
9.997
EUTECH INSTRUMENTS

- Up to two channels measured and displayed simultaneously without cross channel interference
- Wide pH and mV measurement range: -2.000 to 20.000 pH and ±2000.0 mV
- Single-point and multi-point standardization for Conductivity, Resistivity, TDS and Salinity measurements using 2-cell and 4-cell probes. Built-in replatinising circuit
- Advanced real-time on-screen graphing function provides useful indication for specific measurements such as titration
- Extensive setup screens enable you to customise meter to your needs, e.g. isopotential point, temperature units, alarm limits and other functions
- Secure log-in for up to ten users

ATC MTC GLP AUTO-BUFFER AUTO-CAL IrDA RS232

The multi-parameter PC 510 measures pH, mV, conductivity, TDS and temperature in a single meter. User-friendly with advanced features – perfect for research work on a budget!


Save limited bench space with multi-electrode holder
IP54-rated housing and keypad protects meter from accidental splashes
Quick reference slide-out instruction card
Straightforward keypad design ensures easy operation
Non-skid pads hold meter steady during operation

Dual-display LCD

Fuss-free, easy-to-use

CyberScan PC 510

pH/ºC/ºF/mV/Conductivity/TDS

- User-customization
- Multi-point push-button calibration (up to 5 points for pH/Conductivity/TDS)
- Selectable USA or NIST pH buffer standards
- Auto-buffer recognition
- Selectable ATC/MTC
- HOLD function
- Large custom dual-display LCD
- Stability indicator
- Easy interchangeability of probes
- Quick-reference slide-out instruction card
- Electrode with built-in ATC designed for minimal air bubble entrapment during measurement
- Detachable electrode stand organizes multiple electrodes neatly and holds them firmly in place

Multi-Parameter Bench Meters Specifications		CyberScan Premium Bench			CyberScan Economy Bench
		PCD 6500	**PC 6500**	**PC 6000**	**PC 510**
Measuring Parameter		pH/°C/°F/mV/Ion/Conductivity TDS/Resistivity/Salinity/ Dissolved Oxygen/BOD/OUR/SOUR	pH/°C/°F/mV/Ion Conductivity/TDS/Resistivity/Salinity	pH/°C/°F/mV/Conductivity/ TDS/ Resistivity/Salinity	pH/°C/°F/mV/Conductivity/ TDS
Highlights		Windows® CE, 4 channel color touchscreen	Windows® CE, 3 channel color touchscreen	Windows® CE, 2 channel color touchscreen	Bench multi-parameter
pH	Range	-2.000 to +20.000 pH			-2.00 to 16.00 pH
	Resolution	0.1/0.01/0.001 pH			0.01 pH
	Accuracy	±0.1/0.01/0.002 pH +1 LSD			±0.01 pH
	Calibration Points	Up to 5			5
Ion	Concentration	1×10^{-7} to 9.99×10^{10} ppm		–	–
	Resolution	4 Significant figures		–	–
	Accuracy	±0.17 n %		–	–
	Calibration Points	Up to 5		–	–
Temperature	Range	-5.0 to 105.0 °C (DO Temp range: -5.0 to 46.0 °C)			-10.0 to 110.0 °C
	Resolution	0.1 °C			
	Accuracy	±0.2 °C			±0.5 °C
mV	Range	±2000.0 mV			-600 to 600 mV
	Resolution	0.1 mV			0.1 mV (1 mV for above 200 mV)
	Accuracy	±0.2 mV			±0.2 mV (±2 mV for above 200 mV)
Conductivity (Resistivity, TDS, Salinity)	Range	0 to 500 mS/cm over 4 ranges			0 to 19.99/199.9/1999 µS/cm ; 0 to 19.99/199.9 mS/cm
	Resolution	0.001/0.01/0.1 µS/cm ; 0.001/0.01/0.1 mS/cm			0.01/0.1/1 µS/cm; 0.01/0.1 mS/cm
	Accuracy	0.5 % Full scale + 1 LSD			±1 % Full scale + 1 LSD
Dissolved Oxygen (BOD, OUR, SOUR)	Range	0 to 60 mg/L ; 0 to 600 % saturation (0 to 1272 mbar)	–		–
	Resolution	0.01 mg/L ; 0.1 % saturation (0.1 mbar)	–		–
	Accuracy	0.1 mg/L + 1 Digit ; 0.1 % + 1 LSD	–		–
Meter Features	Temperature Compensation	pH: ATC/MTC (-5 to 105 °C) ; Cond: ATC/MTC (-5 to 100 °C) ; DO: ATC (-5 to 46 °C)			–
	Memory	Up to 1000 data sets per parameter			–
	Date/Time Stamp (GLP)	Yes			–
	Operating Temperature	-5 to 45 °C			0 to 100 °C
	Input	DC Socket, DIN connector, SD reader, USB, RJ45, BNC, phono socket			BNC, 6 Pin connector
	Output	USB, IrDA, RS232C			–
	Display	Windows® CE color touchscreen			Dual
	Power Requirements	9 V DC Adapter, 3.3 A (100/240 VAC, SMPS)			9 V DC Adapter (100 V/240 VAC, SMPS)
Dimensions (LxWxH) ; Weight	Meter	16.5 x 23.5 x 8.9 cm ; 1100 g			23 x 18 x 6.3 cm ; 750 g
	Boxed	49 x 28 x 16 cm ; 3700 g			40 x 26 x 9 cm ; 1400 g

Order Code	Part No.	Description
ECPCD650044S	01X374106	CyberScan PCD 6500 pH/pH FET/mV/Ion/Dissolved Oxygen/BOD/OUR/SOUR/Conductivity/Resisitivity/TDS/Salinity bench meter with USB, RJ 45, IrDA, SD card reader, RS232C, pH electrode, Conductivity electrode, self stirring Dissolved Oxygen probe, ATC probe, integral electrode holder, pH and Conductivity sachets & SMPS power adapter
ECPC650043S	01X374005	CyberScan PC 6500 pH/pH FET/mV/Ion/Conductivity/Resisitivity/TDS/Salinity bench meter with USB, RJ 45, IrDA, SD card reader, RS232C, pH electrode, Conductivity electrode, ATC probe, integral electrode holder, pH and Conductivity sachets & SMPS power adapter
ECPC600043S	01X373605	CyberScan PC 6000 pH/pH FET/mV/Conductivity/Resisitivity/TDS/Salinity bench meter with USB, RJ 45, IrDA, SD card reader, RS232C, pH electrode, Conductivity electrode, ATC probe, integral electrode holder, pH and Conductivity sachets & SMPS power adapter
ECPC51043S	01X270607	CyberScan PC 510 pH/Conductivity/TDS bench meter with pH electrode, Conductivity electrode, integral electrode holder & SMPS power adapter

Electrode : :

A collector or emitter of electric charge as in a semi-conducting device; a form of transducer usually paired with an indicator to transform sensed values into information legible to the human eye.

About pH Electrodes

Basic Theory and Application of pH Measurement

pH refers to the power or exponent of hydrogen where 'p' stands for power and 'H' is the symbol of the element Hydrogen.

pH is defined as the negative logarithm of the molar concentration of the active hydrogen ions, pH = -log H^+ .

pH provides a convenient way to compare the relative acidity or alkalinity of a sample at a given temperature. For example, pure water has a neutral pH of 7, where the activities of hydrogen and hydroxide ions are equal. If the activity of hydrogen ion is greater than that of hydroxide ion the sample is described as acidic. In general, as the level of hydrogen ion activity increases, the pH decreases. A pH below 7 is known as acidic. On the contrary, as the level of hydrogen ion activity decreases, the pH increases. A pH above 7 is known as alkaline or basic.

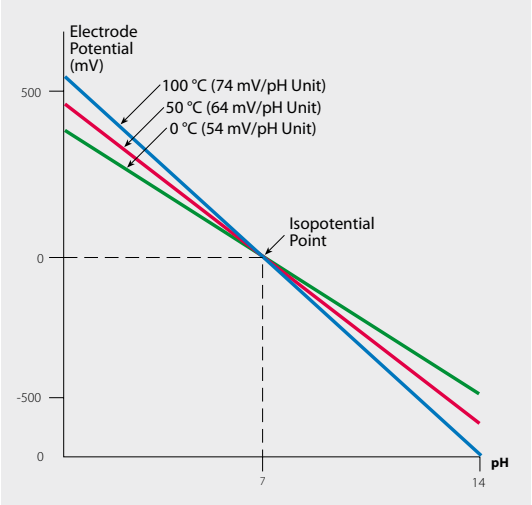
Use of Electrodes for pH Measurement

pH measurement is usually done with the use of a combination electrode. The combination electrode is an electrode system formed by a glass sensing half-cell and an internal reference half-cell. As the reference junction acts as the medium of conductor between the reference electrolyte and the sample to be measured, it must allow free movement of electrons through the junction and into the sample. A potential develops on the membrane surface when a pH electrode comes into contact with a sample and its value varies with the pH of the sample. This variation in potential is measured in mV by a meter and is converted to direct pH values.

Slope

The 'slope' is the voltage produced per pH. In theory, the value is 59.16 mV per pH at 25 °C. Practically, the value ranges between 50 and 58 mV.

Influence of Temperature on pH Measurement



Temperature variations can affect pH. However at a certain pH, usually 7, temperature will not have an effect on the potential of the system. This is known as the 'isopotential point'.

If automatic compensation is not practical, the following equation can be used to determine error:

Magnitude of error = 0.003 pH/°C/pH unit from pH 7

Note: The temperature compensation here refers to electrode related temperature variation and not solution related variations.

Selection Criteria

Eutech combination electrodes offer the convenience of having the reference and measuring electrodes combined in a single housing. They are offered in a variety of configurations to suit most laboratory and field application needs.

Electrode Construction

Glass Body

Glass withstands high temperature of 100 °C or more.

Resistant to corrosive materials and solvents.

Brittle.

Ideal for laboratory use and is easy to clean.

Plastic Body

Not recommended for usage at temperature above 80 °C.

Moderate resistance to highly corrosive materials and solvents.

Durable and withstands rough handling.

Ideal for field use.

Single Vs Double Junction

Single Junction

Ideal for general purpose applications.

Ag^+ ions are in contact with junction and this can cause chemical interaction with sulphur. Not suitable for biological samples or tris buffers.

Double Junction

Prevents interference between the inner fill solution and sample.

Electrolyte is free of Ag^+ ions. Suitable for use with biological samples. Can be used in place of calomel reference electrodes.

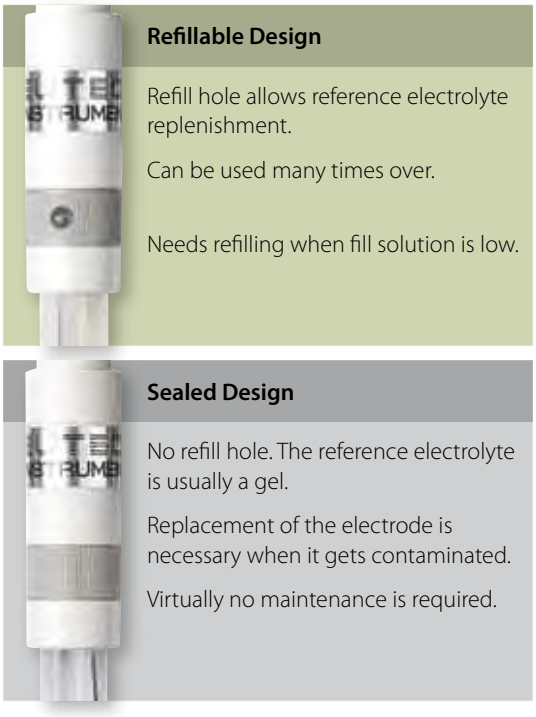
Internal Reference Types

| Calomel Reference (Hg/Hg_2Cl_2) |
Calomel reference electrodes can give potentials accurate to within 0.01 millivolt. The repeatability and potential stability of such electrodes are superior to those of the Ag/AgCl electrode, although only at a constant and relatively low temperature. Calomel is subject to a constant and relatively low temperature fluctuation with a temperature limitation of 80 °C. Calomel is recommended for clinical measurement; for samples containing protein, tris buffers; and for high purity water applications.

| Silver/Silver Chloride Reference (Ag/AgCl) |
Ag/AgCl reference electrodes are largely hysteresis-free and can be used at a higher temperature with lower temperature coefficients. Ag/AgCl is the best general purpose reference with a wide temperature range (-5 to 110 °C).

| Double Junction |
A double junction reference is constructed with an Ag/AgCl inner chamber and a chemically compatible reference solution in the outer chamber. It is recommended for samples containing organic compounds, proteins, heavy metals; and other compounds that interact with silver, such as bromides, iodides, cyanides and sulfides.

Refillable Vs Sealed Design



Refillable Design

Refill hole allows reference electrolyte replenishment.

Can be used many times over.

Needs refilling when fill solution is low.

Sealed Design

No refill hole. The reference electrolyte is usually a gel.

Replacement of the electrode is necessary when it gets contaminated.

Virtually no maintenance is required.

Reference Construction

| Refillable Reference Cell |
Selected for high accuracy, stability, and longer electrode life. Refillable types sacrifice convenience and ease of maintenance.

Patented Twist-Cap Design
Unlike conventional designs which use rubber sleeves, Eutech's 620 series refillable electrodes feature a patented refill-hole with twist-cap design – easy-to-use and leak-proof. Refilling of reference electrolyte is hassle-free and quick with no wastage.

Twist-open the cap to expose the refilling hole

Pour in reference electrolyte with the refilling bottle (that is supplied with all electrodes)

Twist-close the cap

| Sealed Reference Cell |
Sealed gel-filed reference electrodes are designed for convenience where minimal maintenance is required. Slightly lower accuracy and shorter life must be taken into account.

Types of Reference Junctions

Annular Junction

Fast electrode response.

Porous HDPE Junction

Low electrolyte flow, hence more durable.

Flushable Junction

Cleanses by pumping out electrolyte to remove residue, thus eliminates clogging problems in viscous samples.

Open Pore Junction

About 200 times larger than ceramic junctions, ensures increased electrolyte flow for stable junction potential.

Reference Junctions

Some glass combination electrodes feature an anti-fouling annular ceramic junction. The annular junction is formulated with a special ceramic which encircles the glass bulb. Numerous pores in the ceramic provide lower resistance and more stable pH readings. The plastic body combination electrodes come standard with a porous HDPE pin junction. Sleeve junction provides the highest flow rate for difficult samples.

General Purpose Vs Specialty Applications

Most electrodes come in different stem lengths and diameters for specific applications.

General Purpose Applications

Usually measures 120 mm (length) by 12 mm (diameter) and can be used for general applications.

Specialty Applications

Effective for specific applications. For instance the spear tip sensor can be used for the direct pH testing of semi-solids and soft materials. Sleeve type electrode ensures high electrolyte flow so it is ideal for low ionic strength and viscous sample measurements. On the other hand, a flat surface tip electrode is used for flat samples like paper or cloth. Micro-stem electrode fits into thin stem NMR tubes or small vessels. For harsh use, a durable tough bulb electrode that is resistant to breakage is recommended.

About ISE Electrodes

Introduction to Ion Selective Electrodes (ISE)

The ISE functions in the same principle as the pH electrode. The pH electrode is the most commonly used ISE that measures the activity of hydrogen activity in a solution. Ion Selective Electrodes (ISE) respond to ionic activity or concentration in a liquid because of the characteristics of the electrode's sensing membrane. Ideally, the ISE develops an electrical potential which is proportional to the activity or concentration of the ion for which the membrane is selective. For example, the fluoride electrode can be used to directly sense fluoride ion in drinking water.

Eutech offers a wide selection of ISEs for the measurement of ammonia, bromide, cadmium, calcium, carbon dioxide, carbonate, chloride, copper, cyanide, fluoride, iodide, lead, nitrate, potassium, silver, sulfide and sodium.

Direct Analysis with Ionic Strength Adjustment

In the direct analysis method, a sample concentration is determined by measuring the electrode potential and comparing to those obtained in standard solutions. Normally, an Ionic Strength Adjustor (ISA) and/or pH adjustor must be added to both the samples and the standards. This helps in that the closer the standard solution matrix is to the sample matrix, the more valid is the analysis. A number of standard solutions are used to standardize a pH/mV/ion meter, or to construct a calibration curve (by plotting the electrode's output in mV versus the log of the concentration). The sample concentration is then read from the meter or the calibration curve.

The advantages of the direct method of analysis are:

1. Many samples (particularly those with relatively simple ionic backgrounds) can be quickly measured after a single calibration procedure
2. The technique is valid over a wide range of concentrations
3. Sample volume values are not required, and may also vary over a wide range

Calibrating and Ionic Strength Adjuster solutions (ISA) in 480 ml bottles are available for the various ions measured. Please refer to the accompanying instruction sheet of each Eutech ISE.

Other methods of measurement that may need the use of ISA are the known addition, known subtraction, analyte addition and analyte subtraction methods that are applicable with the colour touchscreen research-grade CyberScan series 6000 bench meters. For specific application methods, please refer to the accompanying instruction manuals of the bench meters.

Types of ISE Constructions

Eutech carries ISEs with the following three types of sensing elements.

Membrane/Solid State – The solid, polished crystalline membrane of the solid state ion selective electrode is prepared from either a single or mixture of compounds. Measurement of the potential is taken across this membrane.

Gas Sensing – In general, the sensing element of the gas sensing electrode is made of a Teflon® membrane. The gas permeates through the membrane and changes the pH of the KCl filling solution. The change in pH is directly proportional to the concentration of ions present.

Glass Bulb – Glass body ion selective electrodes are constructed similar to a pH electrode since they have a glass bulb that is sensitive to the species in question.

ISEs are also available in single and double junction constructions. While the single junction electrodes are suitable for clean water applications, the double junction electrodes are designed for harsher applications such as solutions with heavy metals and organic materials.

Calibrating and Ionic Strength Adjuster solutions (ISA) in 480 ml bottles are available. Contact your nearest distributor for more information.

Electrode Selection Guide

4 Simple Steps To Choosing Your Electrode

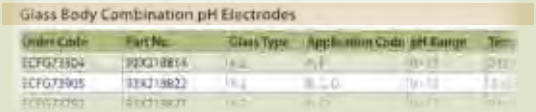
Step 1: Select application

Application Codes & Descriptions
A General purpose, aqueous pH measurements. Quality control, general laboratory and aquarium water.
B Tris buffers, clinical, and biological media containing proteins, creams, fats and cosmetics.

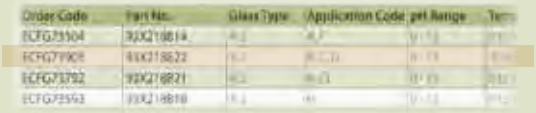
Step 2: Select membrane glass type of your electrode

Membrane Glass Types
X-1 is especially suited for low temperature, nonaqueous solutions and pH
X-2 is best suited for most pH measurements where minimal or no Na+ is
and is designed for pH ranges of 0 to 13 and temperatures of 0 °C to 1

Step 3: Select electrode material



Step 4: Select from table



Application Codes & Descriptions

A General purpose, aqueous pH measurements. Quality control, general laboratory and aquarium water.

B Tris buffers, clinical, and biological media containing proteins, creams, fats and cosmetics.

C Research measurements, fruit juices, beer, milk and yogurt.

D High viscosity solutions such as emulsions, suspensions, paints and varnishes where frequent cleaning of the reference is necessary.

E Non aqueous solutions. Must be used with special reference electrolyte ECRE015.

F Low temperature measurements.

G Low ionic strength solutions, such as high purity water.

H High temperature measurements.

I Surface measurements such as paper, skin, textile, leather and agar plates.

J Solid or semi-solid samples such as cheese, meats, fruits, bread, or other similar sample.

K Rugged use; ruggedized electrode tip. Aqueous media in general.

L Portable pH meter; field and school use.

M Micro sample, such as semi-micro cuvettes and NMR tube.

N Test tube measurements.

O Reference contamination problems which require a double junction reference, such as media containing sulfides, bromides, iodides, and cyanides.

P Measurements in long, narrow vessels.

Q Soil pH measurements.

R Swimming pool, pH control under continuous flow conditions.

S Isoelectric focusing gels and other surface measurements that require a small diameter flat tip.

T Photographic chemical; high pH sample (12 to 14 pH).

U ORP measurements for general purpose.

V Swimming pool ORP measurement.

W ORP measurement for cyanide use.

X ORP measurement requiring a double junction reference.

Y Hydrofluoric acid and abrasive solution measurements.

Z Potentiometric measurements of chlorides and other halides.

Membrane Glass Types

X-1 is especially suited for low temperature, nonaqueous solutions and pH measurements under pH 12.

X-2 is best suited for most pH measurements where minimal or no Na^+ is present. It is a low-resistant glass with a very fast and stable response and is designed for pH ranges of 0 to 13 and temperatures of 0 °C to 135 °C.

X-3 is especially formulated for continuous, long-term use at high temperatures, particularly in strong alkaline solutions above pH 11. It experiences negligible Na^+ ion error above 13 pH. The impedance of the glass is much higher than other glasses, and a slower response will be experienced at room temperature and below. Response time increases as the temperature is elevated.

Glass Body Combination pH Electrodes

Order Code	Part No.	Glass Type	Application Code	pH Range	Temperature Range (°C)	Length x Dia.(mm)	Internal Reference Element
ECFG73504	93X218814	X-2	A, F	0 - 13	0 to 100	110 x 12	Ag/AgCl Refillable
ECFG73905	93X218822	X-2	B, C, G	0 - 13	-5 to 80	110 x 12	Calomel Refillable
ECFG73792	93X218821	X-2	H, O	0 - 13	0 to 110	110 x 12	Ag/AgCl Double Junction Sealed
ECFG73593	93X218818	X-2	H	0 - 13	0 to 100	110 x 12	Ag/AgCl Sealed
ECFG73701	93X218819	X-2	E, O	0 - 13	0 to 100	110 x 12	Ag/AgCl Double Junction Refillable
ECFG74519	93X218823	X-3	H, T	0 - 14	5 to 110	110 x 12	Ag/AgCl Sealed
ECFG63506	93X218810	X-2	A, D	0 - 13	0 to 100	55 x 8	Ag/AgCl Refillable
ECFG43902	93X218961	X-2	B, C, M	0 - 13	-5 to 80	180 x 4	Calomel Refillable
ECFG43904	93X218808	X-2	B, C, M	0 - 13	-5 to 80	55 x 4	Calomel Refillable
ECFG73521	93X218816	X-2	Q	0 - 13	0 to 100	110 x 12	Ag/AgCl Refillable
ECFG63511	93X218828	X-2	J	0 - 13	0 to 100	25 x 8	Ag/AgCl Sealed
ECFG53912	93X218809	X-2	B, J	0 - 13	-5 to 80	25 x 6	Calomel Refillable
ECFG52910	93X218856	X-1	B, S	0 - 12	-5 to 80	55 x 6	Calomel Refillable
ECFG72520	93X218842	X-1	I	0 - 12	0 to 100	110 x 12	Ag/AgCl Refillable
ECFG73711	93X218820	X-2	D, O	0 - 13	0 to 100	110 x 12	Ag/AgCl Double Junction Refillable
ECFG73511	93X218815	X-2	D	0 - 13	0 to 100	110 x 12	Ag/AgCl Refillable
ECFG72710LI	93X218966	X-2	E	0 - 13	0 to 100	110 x 12	LiCl Double Junction Refillable
EC620130	01X218972	X-2	A, B, C, G, L, O, Q, R	0 - 14	0 to 80	160 x 12	Ag/AgCl Double Junction Refillable
EC620131	01X218973	X-2	A, B, C, D, L, O, Q, R	0 - 14	0 to 80	130 x 12	Ag/AgCl Double Junction Sealed
EC620133	01X218975	X-2	A, B, I, O, Q	2 - 14	0 to 50	25 x 6	Ag/AgCl Double Junction Sealed
EC620185	93X218946	X-2	A, B, K, L, O	0 - 14	-5 to 100	102 x 10	Ag/AgCl Double Junction Refillable
EC620181	93X218947	X-2	A, K	0 - 14	0 to 80	102 x 10	Ag/AgCl Refillable
EC620183	93X218948	X-2	A, B, K	0 - 14	0 to 80	102 x 10	Ag/AgCl Double Junction Refillable
EC620286	93X218949	X-2	A, B, G	0 - 14	-5 to 80	106 x 10	Calomel Refillable
EC620293	93X218950	X-2	B, N, P	0 - 14	-5 to 80	150 x 6	Calomel Refillable
EC620095	93X218951	X-2	B, N, P	0 - 14	0 to 80	254 x 3	Calomel Refillable
EC620096	93X218952	X-2	B, N, P	0 - 14	0 to 80	127 x 3	Calomel Refillable
EC620297	93X218943	X-2	B, N, P	0 - 14	-5 to 100	165 x 5	Ag/AgCl Refillable

Plastic and Epoxy Combination pH Electrodes

Order Code	Part No.	Glass Type	Application Code	pH Range	Temperature Range (°C)	Length x Dia. (mm)	Internal Reference Element
ECFE74526	93X218846	X-3	T	0 - 14	-5 to 80	115 x 12	Ag/AgCl Sealed
ECFE72511	93X218834	X-1	I	0 - 12	0 to 100	115 x 12	Ag/AgCl Sealed
ECFE53901	93X218840	X-2	B, N, P	0 - 13	-5 to 80	155 x 6	Calomel Sealed
ECFC72521	01X099412	X-1	A, L, R	1 - 13	0 to 80	110 x 12	Ag/AgCl Sealed
ECFC72521R	01X099413	X-1	A, L, R	1 - 13	0 to 80	110 x 12	Ag/AgCl Refillable
ECFC72522	01X099417	X-1	A, L, O, R	1 - 13	0 to 80	110 x 12	Ag/AgCl Double Junction Sealed
ECFC72522R	01X099414	X-1	A, L, O, R	1 - 13	0 to 80	110 x 12	AgAgCl Double Junction Refillable
EC620132	01X218974	X-2	A, B, G, L, O, Q	0 - 14	0 to 60	120 x 12	Ag/AgCl Double Junction Sealed
EC620109	93X218945	X-2	B, D, G, L, Q	0 - 14	0 to 100	175 x 12	Ag/AgCl Double Junction Refillable
EC620116	93X218944	X-2	A, B, D, G, L, Q	0 - 14	0 to 100	175 x 12	Ag/AgCl Double Junction Refillable
EC620300	93X218953	X-2	A, B, L	0 - 14	-5 to 80	106 x 10	Calomel Refillable

Plastic and Epoxy Combination ORP Electrodes

Order Code	Part No.	Sensor Type	Application Code	Temperature Range (°C)	Length x Dia. (mm)	Internal Reference Element
ECFC79602	01X256613	Platinum Band	U, V	0 to 80	110 x 12	Ag/AgCl Sealed
ECFE77689	93X219107	Antimony	Y	0 to 80	110 x 12	Ag/AgCl Sealed
ECFE78602	93X219122	Gold Disc	W	0 to 80	110 x 12	Ag/AgCl Sealed
ECFC79601	01X256612	Platinum Pin	U	0 to 80	110 x 12	Ag/AgCl Sealed
ECFC79601R	01X254014	Platinum Pin	U	0 to 80	110 x 12	Ag/AgCl Refillable
ECFC79602	01X256613	Platinum Pin	U, X	0 to 80	110 x 12	Ag/AgCl Double Junction Sealed
ECFE79602R	93X218807	Platinum Pin	U, X	0 to 80	110 x 12	Ag/AgCl Double Junction Refillable

** All electrodes are supplied with standard cable length of 1m and with BNC connectors. Refer to our price list for electrodes with longer cable length.*

Ion Selective Electrodes (ISE)

Eutech offers a large selection of Ion Selective Electrodes (ISE) to suit a wide variety of applications. Each electrode has a typical response time of 20 to 30 seconds which varies with solution concentration. Gas sensing electrodes also include replacement membranes. Eutech offers three electrode types: Membrane/Solid State, Gas Sensing, or Glass Bulb.

Choose from single junction or double junction electrodes. Single junction electrodes are ideal for clean water applications. Use double junction electrodes for testing dirty water and solutions with heavy metals or organics. All electrodes are refillable and include 15 ml of electrolyte, filling pipette and instructions. Solid state electrodes also include polishing strips.

ISE General Application Guide

ISE Applications	Concentration Range	Temperature / pH Range	Interferences	Electrode	Standard 0.1M	Standard 100 ppm	Standard 1000 ppm	Ion Strength Adjuster
Ammonia NH_3 - High Purity Power Station Water, Fish Tanks, Sea Water, Waste Water, Plating Baths, Air/Stack Gases and Biological Samples **Type: Gas Sensing**	(17,000 to 0.001 ppm) 1.0 to 5 x 10^{-6} M	0 to 50 °C / Above pH 11	Volatile Amines	ECNH30101B	ECSCSAA1BT	ECSCSAA2BT	ECSCSAA3BT	ECISAAA1BT
Ammonium NH_4 - Boiler Feed Water, Natural Water and Fertilizers **Type: Polymer Membrane**	(18,000 to 0.01 ppm) 1.0 to 5 x 10^{-6} M	0 to 50 °C / pH 4 to pH 10	K^+	ECNH40301B	ECSCSAM1BT	ECSCSAM2BT	ECSCSAM3BT	ECISAAM1BT
Bromide Br^- - Water, Wine, Soil, Plant Tissue, Blood and Clinical Analysis **Type: Solid State**	(79,000 to 0.4 ppm) 1.0 to 5 x 10^{-6} M	0 to 50 °C / pH 2 to pH 14	S^{-2}, 1^-, CN^-, High Cl^- and NH_3 Levels	ECBRO0301B	ECSCSBR1BT	ECSCSBR2BT	-	ECISABR1BT
Cadmium Cd^{+2} - Plating Baths **Type: Solid State**	(11,200 to 0.01 ppm) 0.1 to 1 x 10^{-7} M	0 to 80 °C / pH 2 to pH 12	Ag^+, Hg^{+2}, Cu^{+2}, High PB^{+2} and Fe^{+2} Levels	ECCD0301B	ECSCSCD1BT	ECSCSCD2BT	-	ECISACD1BT
Calcium Ca^{+2} - Water Softening Systems, Boiler Feed Water, Drinking/Mineral Water, Clinical Analysis and Food Applications **Type: Polymer Membrane**	(40,000 to 0.2 ppm) 1.0 to 5 x 10^{-6} M	0 to 50 °C / pH 3 to pH 10	Pb^{+2}, Hg^{+2}, Cu^{+2}, Ni^{+2}, Fe^{+2}, Mg^{+2}, Zn^{+2}, Ba^{+2}, K^{+2}, K^+, Na^+	ECCAL0201B	ECSCSCA1BT	ECSCSCA2BT	ECSCSCA3BT	ECISACA1BT
Carbon Dioxide CO2 and Carbonate $CO3^{-2}$ - Soft Drinks/Carbonated Beverages, Wine, Beer, Fermentation Processes, Bacterial Cultures **Type: Gas Sensing**	(440 to 0.4 ppm) 1 x 10^{-2} to 1 x 10^{-4} M	0 to 50 °C / pH 4.8 to pH 5.2	Volatile Weak Acids	ECCO20101B	ECSCSCO1BT	ECSCSCO2BT	ECSCSCO3BT	ECISACO1BT
Chloride Cl^- - River/Tap Water, Plant Tissue, Soils, Boiler Feed Water, Clinical Analysis, Sweat, Urine, Cement, Plating Baths and Food Samples **Type: Solid State**	(35,500 to 1.8 ppm) 1.0 to 5 x 10^{-5} M	0 to 80 °C / pH 2 to pH 12	S^{-2}, I^-, CN^-, Br^-, OH^-, NH_3, $S_2O_3^{-2}$	ECCLO0301B	ECSCSCL1BT	ECSCSCL2BT	ECSCSCL3BT	ECISACL1BT
Copper Cu^{+2} - Plating Baths and Water **Type: Solid State**	(6350 to 6.4 x 10^{-4} ppm) 0.1 to 1 x 10^{-8} M	0 to 80 °C / pH 2 to pH 12	Ag^+, Hg^{+2}, High Cl^-, Br^-, Fe^{+2} and Cd^{+2} Levels	ECCU0301B	ECSCSCU1BT	ECSCSCU2BT	-	ECISACU1BT
Cyanide CN^- - Plating Baths, Waste Water and Plant Tissue **Type: Solid State**	(260 to 0.13 ppm) 5 x 10^{-6} to 10^{-2} M	0 to 80 °C / pH 11 to pH 13	S^{-2}, I^-, Br^-, Cl^-	ECCN0301B	-	-	-	-
Fluoride F^- - Drinking/Natural Water, Waste Water, Air/Stack Gases, Acids, Sea Water Minerals, Soils, Food, Biological Fluids, Toothpaste/Mouth Wash, Coal, Carbonated Beverages and Bone **Type: Solid State**	0.02 ppm to Saturated (10^{-6} to Saturated)	0 to 80 °C / pH 5 to pH 8	OH^-	ECFO0301B	ECSCSFL1BT	ECSCSFL2BT	ECSCSFL3BT	ECISAFL1BT
Iodide I^- - Milk, Feeds, Plants and Pharmaceuticals **Type: Solid State**	(127,000 to 6 x 10^{-3} ppm) 5 x 10^{-8} to 1.0 M	0 to 80 °C / pH 0 to pH 14	S^{-2}, CN^-, Br^-, Cl^-, NH_3, $S2O_3^{-2}$	ECIO0301B	ECSCSIO1BT	ECSCSIO2BT	-	ECISAIO1BT
Lead Pb^{+2} - Plating Baths and Organic Compounds **Type: Solid State**	(20,7000 to 0.2 ppm) 10^{-6} to 10^{-1} M	0 to 80 °C / pH 3 to pH 8	Ag^{+2}, Hg^{+2}, Cu^{+2}, High Cd^{+2} and Fe^{+2} Levels	ECPB0301B	ECSCSPB1BT	ECSCSPB2BT	-	ECISAPB1BT
Nitrate NO_3^- - Surface/Drinking Water, Sewage Effluent, Soil Extracts, Fertilizers, Plant Tissue, Meat, Potatoes, Spinach, Beets, Baby Food **Type: Polymer Membrane**	(62,000 to 0.5 ppm) 7 x 10^{-6} to 1.0 M	0 to 50 °C / pH 2.5 to pH 11	ClO_4^-, I^-, CN^-, BF_4^-	ECNO0301B	ECSCSNT1BT	ECSCSNT2BT	ECSCSNT3BT	ECISANT1BT
Potassium K^+ - Waste Water, River/Tap Water, Clinical Analysis, Saliva, Serum, Fertilizers, Soils and Wines **Type: Polymer Membrane**	(39,000 to 0.04 ppm) 10^{-6} to 1.0 M	0 to 50 °C / pH 2 to pH 12	Cs^+, NH_4^+, Tl^+, H^+, Ag^+, Li^+, Na^+, Tris 1^+	ECK0301B	ECSCSKO1BT	ECSCSKO2BT	-	ECISAKO1BT
Silver/Sulfide Ag^+/S^{-2} - Sewage Effluent, Soils, Sediments, Plating Baths and Photographic Fixing Solution **Type: Solid State**	(107,900 to 0.01 ppm) 10^{-7} to 1.0 M (Ag^+, S^{-2})	0 to 80 °C / pH 2 to pH 12	Hg^{+2}	ECAGS0301B	ECSCSSS1BT	ECSCSSS2BT	-	ECISASS1BT
Sodium Na^+ - Steam Condensates in Power Plants, Clinical Analysis, Serum, Foods, Wine, Glass, Sea Water, Swimming Pools, Fish Farms and Aquariums **Type: Glass Bulb**	(23,000 to 0.2 ppm) 10^{-6} M to Saturated	0 to 80 °C / pH 5 to pH 12	H^+, K^+, Li^+, Ag^+, NH_4^+, Rb^+, Cs^+, Tl^+	ECNA0201B	ECSCSLNA1BT	ECSCSLNA2BT	ECSCSLNA3BT	ECISALNA1BT

Accessories : :

Accessories

Buffer & Calibration Solutions (480 ml)

Buffers and calibration solutions packed in 480 ml durable plastic bottles – economical and convenient for laboratory use. MSDS and COA can be downloaded under "Support" at **http://www.eutechinst.com**

Order Code	Part No.	Description
pH Buffer Solutions (480 ml Per Bottle)		
ECBU1BT	01X211211	pH 1.68 buffer solution
ECBU4BT	01X211201	pH 4.01 buffer solution
ECBU686BT	01X211242	pH 6.86 buffer solution
ECBU7BT	01X211202	pH 7.00 buffer solution
ECBU9BT	01X211222	pH 9.00 buffer solution
ECBU918BT	01X211271	pH 9.18 buffer solution
ECBU10BT	01X211203	pH 10.01 buffer solution
ECBU12BT	01X211212	pH 12.45 buffer solution
ECDPCBT	01X211216	Protein cleaning solution for pH electrode
ECRE005	01X211206	Storage solution for pH electrode
ECRE006	01X370502	Storage solution for 620 series electrode
ORP Solutions (480 ml Per Bottle)		
ECORPPRE	01X081500	Pre-treatment solution (475 mV)
ECORPQUIN	01X062700	Quinhydrone 255 (255 mV, ±15 mV @ 25 °C)
ECORPQUIN086	01X211215	Quinhydrone 86 (86 mV)
Conductivity Standard Solution (480 ml Per Bottle)		
ECCON84BT	01X211241	84 µS/cm KCl calibration solution
ECCON100BT	01X211217	100 µS/cm KCl calibration solution
ECCON500BT	01X211219	500 µS/cm KCl calibration solution
ECCON1413BT	01X211207	1413 µS/cm KCl calibration solution
ECCON2764BT	01X211214	2764 µS/cm KCl calibration solution
ECCON1288BT	01X211210	12.88 mS/cm KCl calibration solution
ECCON1118BT	01X211244	111.8 mS/cm KCl calibration solution
ECCON5000BT	01X211272	5.0 mS/cm KCl calibration solution
EC44250BT	01X109105	50 ppm 442 calibration solution
EC442300BT	01X109102	300 ppm 442 calibration solution
EC4421000BT	01X109104	1000 ppm 442 calibration solution
EC4423000BT	01X109101	3000 ppm 442 calibration solution
TDS 442 Standard Solutions (480 ml Per Bottle)		
EC44250BT	01X109105	50 ppm 442 calibration solution
EC442300BT	01X109102	300 ppm 442 calibration solution
EC4421000BT	01X109104	1000 ppm 442 calibration solution
EC4423000BT	01X109101	3000 ppm 442 calibration solution
Salinity (NaCl) Standard Solutions (480 ml Per Bottle)		
ECNACL5PPT	01X211230	5 ppt Nacl calibration solution
ECNACL25PPT	01X211231	25 ppt Nacl calibration solution
ECNACL45PPT	01X211232	45 ppt Nacl calibration solution
Refilling Reference Electrolytes (480 ml Per Bottle)		
ECRE001	01X211208	Saturated potassium chloride with silver chloride for single junction pH electrodes
ECRE002	01X211218	Saturated potassium chloride for double junction pH electrodes
ECRE003	01X211225	Sodium chloride
ECRE004	01X211243	Ammonium chloride
ECRE015	01X211253	Lithium chloride in ethylene glycerol for organic samples

CE

Calibration Sachets (20 x 20 ml Per Box)

Economical NIST-traceable sachets for quick, accurate and convenient calibrations. Simply insert electrode into sachet pack, calibrate, rinse and discard sachet – no separate container needed!

Order Code	Part No.	Description
pH Buffer Sachets (20 x 20 ml Per Box)		
ECBU4BS	01X223102	pH 4.01 buffer sachets (NIST traceable)
ECBU7BS	01X223101	pH 7.00 buffer sachets (NIST traceable)
ECBU10BS	01X223103	pH 10.01 buffer sachets (NIST traceable)
ECRINWT	01X223201	pH deionized water rinse sachets (NIST traceable)
Conductivity/Salinity Sachets (20 x 20 ml Per Box)		
ECCON10BS	01X219905	10 µS/cm KCl Conductivity sachets
ECCON447BS	01X219902	447 µS/cm KCl Conductivity sachets
ECCON1413BS	01X219901	1413 µS/cm KCl Conductivity sachets
ECCON2764BS	01X219903	2764 µS/cm KCl Conductivity sachets
ECCON15000BS	01X219904	15000 uS/cm KCl Conductivity sachets
ECCON3000BS	01X219906	3000 ppm KCL Salinity calibration sachets

Buffer Tablets (Box of 100 Tablets) – For Use with Testers Only

These buffer tablets are perfect for small volumes of pH buffers needed for calibration of pocket pH testers. Simply dissolve a tablet in 30 ml of fresh distilled water; calibrates up to ±0.1 pH accuracy.

Order Code	Part No.	Description
pH Buffer Tablets (10 Strips x 10 Tablets Per Box)		
ECBU4BX	01X038201	pH 4 buffer tablets
ECBU7BX	01X038202	pH 7 buffer tablets
ECBU10BX	01X038203	pH 10 buffer tablets

Precision pH Simulator

The Eutech pH-millivolt simulator is a handy, easy-to-use service tool for testing the accuracy of your pH meter. Used for trouble-shooting and fault diagnosis of meters, the simulator works with most pH/redox instruments with BNC connectors. Simulator comes with a BNC cable and a sturdy rubber boot which doubles up as a stand.

- Push button pH/mV selection
- pH accuracy of ±0.05; mV range of ±2
- USA/NIST pH buffer standards simulation
- 16 combination values
- 1 GΩ high input impedance test
- Large display with bright LED
- Splashproof keypad
- Protective rubber boot doubles up as stand
- Power-saving meter runs on 4 'AAA' x 1.4 V batteries

Order Code	Part No.	Description
ECPHSIMULATOR	01X373301	Precision hi-low impedence and multiple buffer pH simulator (with BNC-BNC cable provided)

RS232 Printers

The convenience of printing directly from your meter whenever, wherever! This compact dot-matrix microprinter connects easily to your handheld meters via an RS232C outlet – ideal for data-recording and report-generation. Connecting cable included.

- Dot-matrix
- Paper-roll
- Models with real-time clock and RS232 adapter available

Order Code	Part No.	Description
ECMICROPRNTR01	01X230001	Serial impact microprinter: Dot-matrix, paper-roll portable printer with 25-pin female connector. Includes one roll of paper and a 110/120 VAC power adapter
ECMICROPRNTR02	01X230002	Serial impact microprinter: Dot-matrix, paper-roll portable printer with 25-pin female connector. Includes one roll of paper and a 220/230 VAC power adapter
ECMICROPRNTR02CLK	01X230004	Serial impact microprinter with built-in real time clock: Dot-matrix, paper-roll portable printer with 25-pin female connector. Includes one roll of paper and a 220/230 VAC power adapter
ECADPTRM9M25	09X305002	Adapter for RS232 communication cable: 9-pin male to 25-pin male connector

Electrode Stand with Swivel Arm

Electrode stand with swivel arm allows convenient hands-free operation. Holds up to four standard size electrodes (14 mm diameter) and one ATC probe.

- Weighted 6-inch diameter base allows you to pivot holder 360 ° for more flexibility
- Arm allows you to move electrode side to side or up and down while keeping electrode at a constant verticle angle

Order Code	Part No.	Description
ECPHELSTDC	01X081600	Electrode stand with swivel arm

Applications : :

GLP Compliance in Field Research

The Principles of GLP (Good Laboratory Practice) represent an internationally recognised benchmark of test methods and processes for non-clinical health and environmental safety studies. It provides a uniform standard upon which researches are carried out and forms the basis for mutual acceptance of research data between countries. To researchers and government agencies for environmental control, being GLP-compliant is important in lending recognition to the integrity of their research, as well as ensuring a smooth audit process.

This said, managing the quality of a GLP-compliant research without the support of laboratory facilities can be a tricky affair, especially in settings where several factors are beyond the researcher's influence. Since data collected from field research essentially forms the fundamental to research work – and that means that results collected from the field ought to be as accurate as possible – the process of field data acquisition must be carefully managed, among external elements outside the control of a researcher, to ensure GLP compliance.

Because of this, in the context of studies involving surface water analysis, the meters used during fieldwork are not only important in providing accurate results, but also instrumental in helping to ensure compliance during data-acquisition. In particular, the OECD's published Consensus Document, "Application of the GLP Principles to Field Studies" (OECD, 1999) underscore the need to place special emphasis on two major aspects of fieldwork – Equipment and Data Recording in the field:

Equipment

The apparatus employed should be of appropriate design and adequate capacity. For instruments used in outdoors water analysis, this translates into a need to measure accurately at a required range and resolution. Housing of the equipment should also be sufficiently rugged, and waterproof to survive the outdoors elements. At the same time, sophistication of the apparatus should be balanced with ease-of-use so as not to hinder the test processes.

To ensure accuracy, all research instruments must be cleaned, checked, maintained and calibrated periodically, with calibration benchmarked against national or international standards of measurements.

The GLP Principles require researchers to keep records of each maintenance and calibration session for auditing purposes. For instance, the calibration-due alarm in the CyberScan 600 series alerts on a user-defined calibration date allowing them to keep check of calibration dates easily. Late calibrations are reflected in the meter, and all calibration details can be generated into a report and saved as an in-editable file in the computer using the supplied Data Acquisition Software (see Figure 1).

Figure 1: The CyberScan 600 Series allows the generation of a detailed calibration report that records the time, date, selected buffer option as well as the electrode performance slope.

Data Recording

The GLP Principles require raw data generated during the field research to be documented legibly, directly and promptly. Using the auto-logging function in a meter can facilitate immediate and accurate data-entry without the risk of accidental data-loss or human error that may occur with recording on paper. For full traceability, recorded data must be stamped with time and date of measure.

Figure 2: Raw data collected from the field is transferred wirelessly to a computer in the form of a comprehensive report.

Figure 3: Programme prompts user for identification when transferring data out into editable versions.

A common problem with field-research is the amount of storage facilities available for recording data. Instruments intended to measure and record should have enough temporary storage memory for sufficient samplings to ensure integrity of the research.

Until the raw data can be transferred for analysis and archiving, the data should be secured from accidental deletion or editing. For this, password protection and volatile memory function on the meter is important to ensure that the acquired data is well-preserved, even when the equipment is out of batteries.

Finally, in the case of where data is transferred to and generated using a computer programme, the designed programme used must ensure identification of the individual responsible for data-entry. Figure 2 and 3 illustrate how the data acquisition software accompanying the CyberScan 600 series waterproof handheld meters prompt for identification person responsible for the entry. The data, which is directly and wirelessly transferred to the computer, is presented in the form of an in-editable report. Researchers can transfer the information out onto another programme for further analysis. Any changes to the raw data should not obscure the original figures, and should be fully justified for by means of documentation in the "Note" section.

Unlike the laboratory setting, the nature of fieldwork makes it more difficult to implement GLP Principles in the research process.

While a field researcher cannot do more to control the weather, technology has made it possible to obtain better equipment support. By choosing the right instruments, complying with GLP can be effortless, even when conducting researches in the field with external factors, without the infrastructure of a laboratory.

Measure Smart with the Eutech CyberScan 600 Series

Eutech's CyberScan 600 Series – a new line of waterproof, intuitive handheld meters designed especially for rugged, outdoor applications, yet versatile and powerful enough to be used in the laboratories.

Incorporating unparalleled functionality such as compensation of temperature, salinity and barometric pressure, adjustable cell constant settings, high resolution and wide measurement ranges, the meters are engineered to help you achieve unprecedented, lab accurate results effortlessly, ensuring high quality GLP-compliant research.

Presently available for high-quality measurements of the following parameters: pH, conductivity and dissolved oxygen. To find out more about smart measuring, visit our website at **www.eutechinst.com**, or simply email us at **marketing@eutech.com**

Sources:
"OCED Series on Principles of Good Laboratory Practice and Compliance Monitoring: OECD Principles on Good Laboratory Practice", OECD, 1997
"OECD Series on Principles of GLP and Compliance Monitoring Number 6 (Consensus Document): The Application of the GLP Principles to Field Studies", OECD, 1999

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Pool Water Maintenance & Analysis

When it comes to pool management, nothing is more important than the chemistries of your water. A well-maintained pool with a good chemical balance keeps the algae away, ensures long lifespan for your pool equipments and provides for an inviting swim. Here are some parameters which you should take note of when maintaining your pool:

1. pH

pH is the measure of how acidic or alkaline your water is. It is the most important parameter in pool water electrochemistry and affects all the other parameters in your water.

When pH is too low (water is too acidic)
• Corrosion of metallic fittings and etching of plaster walls • Stains from metal rust • Chlorine residuals dissipates quickly • Eye and skin irritation occur

When pH is too high (water is too alkaline)
• Cloudy water • Scale deposits • Overworked filtration • Reduced Chlorine efficiency

| Ideal pH Level: 6.8 - 7.8 pH |

Eutech offers a series of waterproof pH testers that measure up to 2-decimal accuracies and allow you to measure temperature at the same time.

2. Total Alkalinity

While pH is a measurement of the hydrogen ion concentration, alkalinity measures the ability of a solution to neutralize hydrogen ions. In other words, it is the measure of water's resistance to pH change, or how "sensitive" the pH level of your water is to changes.

When alkalinity is too low
• pH level is extremely sensitive to introduction of chemical or impurities in the water. This makes it difficult to control and stabilize the pH level of your water

When alkalinity is too high
• pH level becomes resistance towards change. This makes it difficult to adjust your pH level

| Ideal Alkalinity Level: 80 -150 ppm |

3. Total Dissolved Solids (TDS)

TDS refers to the amount of dissolved materials in your pool water. In other words, the lower your TDS level, the better your pool water quality. TDS is influenced by many factors, among which includes the chemicals you've added to balance the water chemistries. Although a TDS level of 4,000 ppm has been observed in clean water on occasion, the recommended TDS level should not exceed 1,500 ppm.

When TDS level is too high
• Low water hygiene level • Staining of pool surfaces • Scaling • Hard water

| Ideal Alkalinity Level: 80 - 150 ppm |

TDS measurement is a simple one-step process with Eutech's TDS waterproof pocket testers. User-friendly and so light, it floats on water!

4. Calcium Hardness & Lime Balance

Calcium hardness refers to the amount of dissolved calcium salt in your water.

When calcium is too low
• Your pool water may leach calcium from your walls, causing pits to form in the plaster surface

When calcium is too high
• Scales formation and clouding of water

5. Disinfection

Chlorine – Chlorine is the most common sanitizer for swimming pools. Proper disinfection is paramount to preventing water-borne diseases from spreading between swimmers and prevents the growth of unwanted algae and bacteria in your pool.

Chlorine which has yet to react with other substances in the water is called Free Chlorine.

Chlorine which has already reacted with other substances and is no longer available to oxidize organic substances is called Combined Chlorine.

Free Chlorine = Free Chlorine + Combined Chlorine

On the contrary to common beliefs, it is a lack of chlorine which results in the strong, pungent smell emitted by combined chlorine. Sufficient chlorine added will dissipate this odor. On the other hand, excessive amount of chlorine present can cause eyes and skin irritation and pose as a health hazard.

| Ideal Chlorine Level: (Total) 0.5 - 2.5 ppm ; (Free) 0.5 - 2.5 ppm ; (Bounded) < 1.0 ppm |

Eutech's C 401, C 301 and C 201 colorimeters measure free and total chlorine over a range of 0 - 6 mg/L.

Bromine – Bromine is very similar to chlorine in terms of chemical structure. However, because of its high boiling point, bromine is less reactive than chlorine and hence more stable. As a pool disinfectant, bromine has many advantages over chlorine – it has fewer odors, is less likely to cause eyes and skin irritation and more importantly, its efficiency as a sanitizer is unaffected by pH fluctuations. However, the higher cost of bromine over chlorine makes it a less popular option for pool owners and operators.

Measure bromine in 3 easy steps with Eutech's C 104 colorimeter which provides a range of 0 - 13.5 ppm.

Ozone – Ozone is one of the strongest and most rapid oxidizer available. It is odorless, does not cause eyes or skin irritation and does not pose as a health hazard. Although more expensive as a disinfectant, ozone does not require any stabilizer and causes neither scaling nor corrosion. In view of this, many top spas and pool owners are beginning to recognize ozone as a more economical solution to pool sanitizing in the long run over chlorine.

Eutech's C 105 colorimeter provides for fast and simple ozone measurement over a range of 1.4 ppm to 4.1 ppm.

6. Balancing Your Pool Water

The chemical make-up of your water should strike a harmonious balance.

To balance your chemistries, measure and award points to each of the parameters in table 1.1. Perfectly balanced water should obtain a score of 12.1.

pH	Temperature	Alkalinity	Calcium Hardness
6.8 = 6.8	20 °C = 0.50	50 = 1.70	50 = 1.3
6.9 = 6.9	22 °C = 0.55	75 = 1.90	100 = 1.6
7.0 = 7.0	24 °C = 0.60	100 = 2.00	150 = 1.8
7.1 = 7.1	26 °C = 0.65	125 = 2.10	200 = 1.9
7.2 = 7.2	28 °C = 0.70	150 = 2.20	250 = 2.00
7.3 = 7.3	30 °C = 0.73	175 = 2.25	300 = 2.10
7.4 = 7.4	32 °C = 0.76	200 = 2.30	350 = 2.15
7.5 = 7.5	34 °C = 0.80		
7.6 = 7.6	36 °C = 0.82		
	38 °C = 0.85		

Pool maintenance can be a breeze in the long run with a proper maintenance routine in place. The right water treatment will keep your pool water algae-, bacteria- and pollution-free. More importantly, it keeps your water safe for a dip with your family.

- **Ag/AgCl** – Silver/silver chloride reference electrode is good for general purpose applications with a wide temperature range of -5 to 110 °C.

- **ATC** or Automatic Temperature Compensation automatically corrects the measured value based on the temperature of the solution (with use of temperature sensor).

- **Auto-Buffer Recognition** identifies and ensures correct pH buffer values are being used during calibration.

- **Auto-CAL** or Automatic Calibration frees users from cumbersome fine adjustment or manual selection of desired standards/ buffer values in calibration routine.

- **Auto-Data Logging** allows measured or stored data sets being transferred seamlessly into memory or external peripherals at preset time interval or whenever readings stabilise.

- **Auto-Ranging Capability** scans and switches to the appropriate measurement range.

- **Barometric Pressure Compensation** compensates oxygen solubility for changes in Barometric Pressure.

- **Bi-Directional RS232 Linkup** provides two-way RS232 communication between meter and computer via a cable to remotely control and manage meter operation.

- **BNC** is known as British Naval Connector or Bayonet Nut Connector. This connector is used to join segments of coaxial cable.

- **BOD** or Biochemical Oxygen Demand is a measure of the amount of oxygen that is consumed by bacteria as they decompose the organic components of waste. DO measurements are usually made at the beginning and end of a five-day incubation period for a standard test.

- **Bromine** – Please refer to page 60 of this catalogue.

- **CAL-Due Prompt** reminds user to calibrate the meter at set regular intervals.

- **CE-Certification** or CE Marking is a conformity marking consisting of the letters "CE". CE is an abbreviation for 'Conformité Européenne', French for 'European Conformity'. The CE Marking indicates that the product it is affixed to conforms to all relevant essential requirements and other applicable provisions that have been imposed upon it by means of European directives, and that the product has been subject to the appropriate conformity assessment procedure(s). For more information, please refer to website at www.cemarking.net

- **Cell Constant** or k is the ratio of the distance between the two metal plates and surface area of the two metal plates during measurement.

- **21 CFR Part 11** – A set of criteria set forth by the FDA which qualifies electronic records and signatures to be equivalent in reliability to paper records and handwritten signatures on paper. For more information, please refer to the "Code of Federal Regulations" at www.fda.gov.

- **Chlorine** – Please refer to page 60 of this catalogue.

- **Chlorine Dioxide** – Please refer to page 60 of this catalogue.

- **Colorimetry** – Please refer to page 60 of this catalogue.

- **Conductivity** – Please refer to page 30 of this catalogue.

- **Cyanuric Acid** – Please refer to page 60 of this catalogue.

- **DAS** or Data Acquisition Software connects the bench meter using a RS232 communications cable and can be used to control the meter from a PC. This software is available with the benchtop series 1100/2100, 1500 and 6000. The software also provides Data Acquisition functions and allows data from the meter to be captured and stored for processing on a PC. Other features of the software are the ability to zoom in to certain areas of the graph, set the length of time to capture data, set meter settings like temperature units, pH and mV alarm limits, calibration reminders, resolution and many other parameters. Updated versions are available on the website www.eutechinst.com

- **DIN** or Deutsches Insitut für Normung eV is a German national organization for standardization. A DIN buffer set usually refers to the 1.09, 3.06, 4.65, 6.79, 9.23, and 12.75 pH. Selected Eutech meters such as the CyberScan pH 310 is capable of up to 6 points of calibration if the DIN buffer standard is chosen. A DIN connector is a connector that conforms to one of the many standards defined by DIN. Eutech meters that feature the DIN connector include the CyberScan bench series 1500 and 6000.

- **DPD Method** is US EPA accepted for reporting drinking water analyses (Free and Total Chlorine) and wastewater analyses (Total Chlorine only). Please refer to the "Standard methods for the Examination of Water and Wastewater" and US EPA method 330.5 for wastewater and Standard Method 4500-Cl G for drinking water for more information.

- **DO** or Dissolved Oxygen – Please refer to page 46 of this catalogue.

- **Double-Junction Protection** in electrodes is necessary to prevent electrode poisoning. Reference junction poisoning is inevitable especially in cases where there is sulphide content in the sample. Sulphide is known to attack silver in the reference and shorten the electrode's useful life. With the double junction protection, the 'poison' takes longer to reach the reference junction hence extending the electrode's useful life. The new range of large display waterproof pocket testers (pages 13 to 16) feature double junction electrodes for long lasting performance.

- **Electrode Diagnosis** provides useful information on electrode condition and characteristics after each calibration.

- **EMC** or Electromagnetic Compliance is one of the CE Directives specified for electrical products. All Eutech products with CE-certification adhere to the EMC Directive. For more information, please refer to www.cemarking.net

- **EPA** or Environmental Protection Agency leads the environmental science, research, education and assessment efforts in the US. For more information, please visit www.epa.gov

- **Formazin Standards** – Formazin was first established by the US Environmental Protection Agency (See EPA) as a Turbidity standard in 1926. However, its importance as a standard has been relegated due to its many shortcomings, one of which being that one of the chemicals which formazin is derived from, hydrazine sulphate, is carcinogenic. Eutech's Turbidity meters use a safe, non-toxic, non-carcinogenic alternative to formazin standards which can be used for calibration directly without mixing or dilution.

- **GLP** or Good Laboratory Practices refers to regulations that are observed to ensure high quality experimental standards and reliable data.

- **HVAC** stands for Heating, Ventilation and Air Conditioning System.

- **HCl** is the chemical formulation of Hydrogen Chloride that is a highly corrosive and toxic colorless gas that forms white fumes on contact with humidity. These fumes consist of hydrochloric acid which forms when hydrogen chloride dissolves in water. Hydrogen chloride gases as well as hydrochloric acid are important chemicals in chemistry, science, technology, and industry. A 0.1 M HCl can be prepared as 1 % pepsin solution to break down any protein deposits on an electrode. For more information on electrode cleansing, please refer to page 12 of this catalogue.

- **IP** stands for 'Ingress Protection'. An IP number is used to specify the environmental protection of enclosures around electronic equipment. These ratings are determined by specific tests. The IP number is composed of two numbers, the first referring to the protection against solid objects and the second against liquids. The higher the number, the better the protection. Eutech products such as the CyberScan waterproof series and waterproof testers have IP67 housing. The first digit '6' indicates total protection against dust and second digit '7' protects against the effects of immersion between 15 cm and 1 m.

- **IrDA Communications** – IrDA stands for Infrared Data Association, a group of manufacturers who developed a standard for transferring data via infrared light waves; a secure wireless link that allows the meter to be connected to a computer or printer without the help of cables.

- **ISE** – Please refer to page 85 of this catalogue.

- **ISFET** or Ion Sensitive Field Effect Transistor is a non-glass electrode typically used for food, beverage and pharmaceutical applications where the use of glass electrodes on the production floor is prohibited. ISFET electrodes rely on a silicone chip which, when placed in contact with the sample, detects and measures the variable voltage potential between its surface and underlying semiconductor material. This variable potential that is proportional to the hydrogen ion concentration in the sample is used to derive the pH value.

- **ISO 7027** is the water quality standard measured in terms of Turbidity determined by the International Organisation for Standardisation. For more information on ISO, please refer to the website www.iso.org Eutech Turbidimeters TN 100 and TB 1000 (infrared light source models) comply with the ISO 7027 standards.

- **kPA** or Kilopascal refers to a unit of pressure. 1 kPa is approximately the pressure exerted by a 10-g mass resting on a 1-cm^2 area. 101.3 kPa = 1 atm. There are 1000 pascals in 1 kilopascal.

- **KCl** refers to the Chemical Compound Potassium Chloride which is a metal halide composed of potassium and chlorine. KCl is used in medicine, scientific applications and food processing. A heated diluted KCl can be used to unclog a reference junction. For more information on electrode cleansing, please refer to page 12 of this catalogue.

- **LSD** or Least Significant Digit refers to the right-most active digit of a digital display.

- **MTC** or Manual Temperature Compensation is an alternative method for temperature compensation through the manual input of sample temperature value. ATC is more practical in most applications.

- **Multiple-Point Calibration** ensures the highest accuracy across the full measurement range.

- **NIST** or National Institute of Standards and Technology is a non-regulatory agency of the United States Department of Commerce's Technology Administration. The institute's mission is to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life. The NIST buffer standards usually refer to pH 1.68, 4.01, 6.86, 9.18, and 12.45. For more information, please visit www.nist.gov

- **NTU** or Nephelometric Units is the preferred expression of Turbidity. For more information on Turbidity, please refer to page 56 of this catalogue.

- **Non-Volatile Memory** retains stored data and calibration information indefinitely even if power is disconnected.

- **Normalisation Temperature** is used to standardise measurements to a known ambient temperature value (generally at 20 °C or 25 °C).

- **Open Pore pH Electrode** makes use of a single pore capillary reference junction that is about 200* times larger than a typical ceramic junction. (*With reference to Eutech open pore electrodes EC620130, EC620131, EC620132 and EC620133.) This unique construction protects the electrode from clogging even in difficult samples. If used in combination with specially formulated electrolyte, the flow rate into the pore is faster and leads to better contact between the reference electrode and sample. This generates a shorter response time and more accurate measurements. For more information, please refer to page 84 of this catalogue.

- **ORP** or Oxidation Reduction Potential – Please refer to page 12 of this catalogue.

- **OUR** or Oxygen Uptake Rate values are given in mg/L/hr and is usually applicable in the study of the concentration of micro-organisms.

- **Ozone** – Please refer to page 60 of this catalogue.

- **pH** – Please refer to page 10 of this catalogue.

- **pH Slope** - Please refer to page 10 and 11 of this catalogue.

- **PWB** or Pure Water Buffer refers to water with low ionic concentration.

- **Replatinising** is necessary when the platinum-black layer of the Conductivity sensor wears off over time. The Conductivity section of the sensor consists of two platinum plates or wires that are plated with a layer of "platinum-black". Usually this is a relatively soft layer and is required for stable, accurate measurements. In time, the platinum-black layer may wear off in some applications and the sensor will require replatinising.

- **Resistivity** – A measure of how strongly a material opposes the flow of electric current. A low Resistivity indicates a material that readily allows the movement of electrical current charge.

- **RJ45** or Registered Jack 45 is a physical interface often used for terminating twisted pair type cables. "RJ" stands for Registered Jack which is part of the United States Code of Federal Regulations. It has eight "pins" or electrical connections per connector. Common uses include internet and Ethernet cables. The CyberScan Series 6000 offers RJ45 connector for internet and Ethernet communication capabilities to conduct on-the-spot online research and access global email account.

- **RS232** – RS232 stands for Recommended Standard-232, A TIA/EIA standard for serial transmission between computers and peripheral devices (modem, mouse, etc.). Using a 25-pin DB-25 or 9-pin DB-9 connector, its normal cable limitation of 50 feet can be extended to several hundred feet with high-quality cable.

- **Salinity** – Please refer to page 30 of this catalogue.

- **Salinity Correction** compensates the variations in oxygen solubility due to salt concentration in the sample.

- **Self-Diagnostic Messages** prompt and guide users with error message codes or graphical icons for easy meter troubleshooting.

- **Soft Keys** – Soft keys are located close to the screen-readouts that display the functions selected when the keys are pressed; commonly used on small devices with limited space such as handphones, PDAs and handheld meters.

- **SOUR** or Specific Oxygen Uptake Rate indicates biological activity of microbes in the wastewater treatment process and the load placed on them. SOUR is the relationship between oxygen uptake and the amount of solids. SOUR values are given in mg/hr/g.

- **Stability Function** averages and displays indicator or icon whenever readings stabilise.

- **TDS** or Total Dissolved Solids – Please refer to page 30 of this catalogue.

- **TDS Conversion Factor** is a factor for converting Conductivity to TDS value to best suit the specific sample being measured (e.g. KCl = 0.5, 442 = 0.67 @ 25 °C).

- **Temperature Coefficient** indicates the temperature influence in the chemical equilibrium (eg.disassociation) of the solution due to non-linearity of intrinsic salt/chemical property varies from one sample to another (typically 2.1 %/°C at 25 °C).

- **Temperature Compensation** is necessary as most electrochemical parameters (i.e. pH, Conductivity, DO) are temperature dependent and most applications require some form of temperature compensation to ensure standardized measured values. Please refer to the definitions for ATC and MTC.

- **Thermometry** – Please refer to page 64 of this catalogue.

- **Turbidity** – Please refer to page 56 of this catalogue.

- **USEPA Method 180.1** – A regulatory method set by US EPA which requires the following to be included in the design of Turbidity meters: 1. Primary detector for nephelometric (90 degree) measurement; 2. Light source tungsten filament lamp (white light); 3. Spectral response peak for the detector between 400 and 600 nm, the primary wavelengths of light.

Warranty
Eutech Instruments warrants its instruments to be free from manufacturing defects as follows: pocket testers for 2 years, handheld and bench meters for 3 years, and electrodes/sensors for 6 months (unless otherwise specified).

Certification
All Eutech products are CE certified to comply with global standards for electromagnetic emission and interference.

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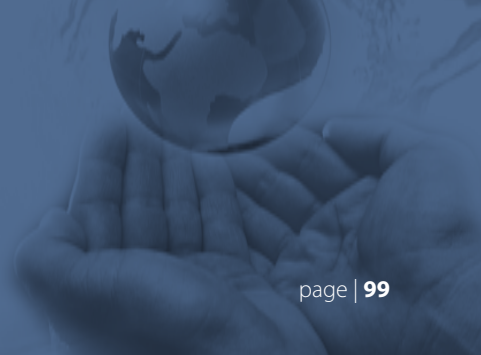

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